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Report to the Congress
of the
Commission on the Role of Gold
in the
Domestic and International Monetary Systems

March 1982

Contents of the Commission's Permanent Record

Volume 4

VI. Discussion Drafts by Dr. Schwartz

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MEMORANDUM

TO: Members of the Commission on Gold

FROM: Anna J. Schwartz

DATE: July 8, 1981

SUBJECT: Options Concerning Gold the Commission May Want to Consider

This memorandum lists seven types of monetary standards among which the United States (and other countries) could choose. Five of these are forms of the gold standard. Under a gold standard, of whatever type, the monetary authority maintains a fixed price of gold by purchase and sale. That price must rule not only in transactions by the monetary authority but also in market transactions in which private participants are free to engage.

The memorandum considers several issues related to the choice of a gold standard of whatever type:

1. how the gold standard operates in theory
2. how and why the world retreated from the discipline of the gold standard
3. the market for gold
4. the role of central banks under the gold standard
5. the consequences for economic stability of choosing a form of the gold standard
6. a summary of costs and benefits of adhering to a gold standard
7. the requirements for restoration of a gold standard in the United States
8. problems involved in finding the right price of gold at which to resume

The memorandum concludes with a discussion of two alternatives to the gold standard.

It will be useful at the first meeting to learn from each member which of the listed options he personally favors. Should the list prove incomplete, members can add options of interest to them. On the basis of this information, we can structure future meetings to allow for a full discussion of all the indicated options.

Copies to:

Secretary Regan
Mr. Costamagna
Mr. Coyne
Senator Dodd
Senator Jepsen
Dr. Jordan
Mr. Lehrman
Dr. McCracken
Representative Neal
Mr. Partee
Representative Paul
Representative Reuss
Mr. Rice
Senator Schmitt
Dr. Wallich
Dr. Weidenbaum
Representative Wylie

Types of Monetary Standards

1. a gold coin standard with 100 per cent gold cover for nongold money and no central bank
2. a gold coin standard with fractional reserves held by the government against its note issues and by commercial banks against their deposits, with or without a central bank, with convertibility for all holders of nongold money in gold coin
3. a gold bullion standard with fractional reserves against the central bank's monetary base (currency plus bank reserves), no gold coin circulation, with convertibility for all holders of nongold money limited to large minimum amounts
4. a gold exchange standard with fractional reserves and with a central bank tied to a currency of a center country that is on a gold coin or gold bullion standard
5. the Bretton Woods dollar/gold exchange standard, with convertibility limited to official institution dollar assets "for the settlement of international balances or for other legitimate monetary purposes"
6. a commodity standard other than gold, with convertibility for all holders of noncommodity money in the designated basket of commodities
7. an inconvertible paper standard, with a central bank free to exercise discretion or else subject to a prescribed rule with respect to the quantity of money outstanding

Issues Related to Choice of a Gold Standard

1. How the Gold Standard Operates in Theory

The gold standard is a form of a commodity monetary standard, the commodity in question -- physical quantities of gold. Of the numerous commodities that served as money in world experience, gold emerged as the most widely accepted. Under a 100 per cent gold standard, gold would be the only money.

The supply of money and the prices of goods in terms of that money would be determined in the market by the demand for gold for monetary and nonmonetary uses and by the supply of gold, which would be governed by the opportunity cost of producing gold. The demand for gold for nonmonetary use would be governed by the relative price of monetary gold and all other commodities. The demand for monetary gold would be governed by (a) total wealth available to hold in asset form; (b) the total amount of goods and services produced; (c) the average price of those goods and services; (d) the return on holding monetary gold relative to the return available on alternative assets; and (e) the tastes and preferences of holders of money.

In such a system, the money supply would vary automatically with the profitability of producing gold. A rapid increase in the output of gold, due to gold discoveries or technological improvements in gold mining, would raise the prices of all other goods in terms of gold, making them more profitable to produce than gold, and thus ultimately leading to a reduction in gold output. Moreover, the initial reduction in the purchasing power of gold would lead to a shift in the demand for gold from monetary to nonmonetary use, thus reinforcing the output effects. Conversely, a decline in prices of goods and services, due to technological improvements in the nongold sector, would increase the profitability of gold production, encouraging increased gold output, which would ultimately tend to raise the price level. The initial increase in the purchasing power of gold would also lead to a shift in the demand for gold from nonmonetary to monetary use, thus reinforcing the output effects. Long-run price stability would be the result.

Government intervention in the monetary system would be limited to its undertaking to buy gold from the public at a fixed price and converting it into coin, and to sell gold to the public at a slightly higher fixed price, if it so chose, the difference between the two prices representing seigniorage -- the government revenue derived from the manufacture of coins. Each government would define its monetary unit as a specific physical quantity of gold, that so/the values of all national monetary units would be fixed in relation to each other, thus establishing par exchange rates. The costs of shipping, packing, and insuring gold would set the gold points -- upper and lower limits to fluctuations around the par exchange rates.

Thus, in addition to serving as domestic currency, gold would be the international medium of exchange, providing the means for settling imbalances in international payments. A deficit in the balance of payments would be paid in gold, the outflow reducing the country's domestic money supply, ultimately its price level, and hence enhancing the country's appeal as a source of goods and services to foreigners, and reducing domestic demand for foreign goods and services. The surplus country would experience an inflow of gold that raised its domestic money supply, ultimately its price level, and hence diminishing that country's appeal as a source of goods and services to foreigners and increasing domestic demand for foreign goods and services. Thanks to this automatic adjustment process, the duration and size of imbalances would be self-limiting. Gold flows would serve to equalize price movements across countries.

2. How and Why the World Retreated from the Discipline of the Gold Standard

The foregoing description of the gold standard in theory was never realized in practice. The earliest departure from the ideal 100 per cent gold standard was the creation of substitutes for gold. The reason is obvious -- a 100 per cent gold standard is costly in terms of the use of real resources. Paper money substitutes require a much smaller amount of resources to produce. Such substitutes included fiat currency issues by governments and commercial bank issues of notes and deposits. A further departure from the ideal was the cessation of gold coinage and the prohibition of the circulation of gold coins. Convertibility of fiduciary issues was limited to an exchange for gold bullion.

The gold standard in practice was a system of paper money, with gold reserves of the government and of the banks equal to only a fraction of their outstanding monetary liabilities. The incentive to limit the size of gold reserves was strengthened during trend periods when the supply of gold did not keep pace with the demand for monetary and nonmonetary uses. The incentive was weakened in the aftermath of cyclical episodes when public alarm about the adequacy of the reserve ratio induced a contraction of monetary liabilities.

A fractional reserve gold standard accentuated the effects of gold flows on the quantity of money. A one-dollar gold inflow, depending on the size of the reserve ratio, might increase the domestic quantity of money as much as \$8 or \$10, a one-dollar gold outflow might reduce the quantity of domestic money by as much as \$8 or \$10, with parallel effects on domestic spending and prices.

International capital flows alleviated to some extent either the size of gold flows or their consequences. Short-term capital flows served to reduce and smooth the immediate flows of gold that would otherwise have been required to settle payments imbalances. Long-term capital flows enabled developing

countries to borrow real resources from developed countries by running a persistent excess of imports of goods and services over exports of goods and services without entailing gold flows. In the event of a rise in the domestic quantity of money, in the short run, interest rates would tend to decline, inducing investors to shift funds to foreign money markets. The size of the change in export prices relative to import prices that would otherwise have occurred would be reduced by the resulting gold outflow.

Central banks in Europe predated the gold standard. Their behavior often conflicted with the discipline the ideal gold standard imposed. They did not necessarily respond to a loss of gold due to balance of payments deficits by actions to reduce the domestic quantity of money outstanding, or to a gain of gold due to balance of payments surpluses by actions to increase the domestic quantity of money outstanding. Scholars continue to debate the extent to which such behavior by the Bank of England and other central banks characterized the period before 1914. After World War I, the issue is not in doubt: central banks, including the Federal Reserve System, frequently chose not to permit gold flows either to expand or contract the domestic quantity of money, or to do so to a lesser degree than full adjustment would have required. The gold standard was not automatic but managed.

Central banks also economized on gold holdings by using other currencies as reserve assets, principally sterling before 1914, increasingly dollars thereafter. Under the gold exchange standard, gold flows were minimized, with adjustment of international payments imbalances taking place mainly by transfers of reserve assets in the chief money markets. Under the Bretton Woods system, adjustment of payments imbalances was postponed, if not evaded, by borrowing arrangements and by the imposition of capital controls and protectionist devices. The latter in effect were implicit exchange rate changes, sometimes supplemented by multiple exchange rates.

Apart from these institutional changes, a gradual shift in attitudes occurred toward the advantage of adhering to the gold standard. The value of external stability in maintaining a fixed rate of exchange between the domestic money and foreign moneys came to be regarded as purchased at the cost of instability in the domestic money supply, domestic spending, prices, and employment. The simple rule for governments to maintain a fixed price of gold was finally overthrown in the 1970s. Maintenance of the price of gold was not an objective of either the Employment Act of 1946 or the Humphrey-Hawkins Full Employment and Balanced Growth Act of 1978.

3. The Market for Gold

An essential element in the proper functioning of the gold standard is that the flow supply of gold match the flow demand. The rate of growth of gold output must be adequate to meet both monetary and nonmonetary demands, since not all of annual output is available for monetary purposes. A part of it is used in industry for the manufacture of jewelry and art objects, for dental uses, and for other nonmonetary purposes. Nonmonetary use also includes private gold holding in both developed and less developed countries.

The amount of monetary gold available for annual additions to the stock of monetary gold is a crucial factor in determining the trend of the price level. If the annual rate at which the monetary gold stock increases is below the rate of population growth and real income growth, the consequence is a worldwide declining trend in the price level. That trend will itself promote private gold holding since capital gains will accrue to gold so held. In the opposite case, with increases in the monetary gold stock above the rate of population and real income growth, the effect is a rising trend in the price level and a possible negative effect on private gold holding.

The price of gold will obviously affect market fundamentals of flow demand and supply. However, gold is an exhaustible resource, with short-run rising cost curves. Unless there is a technological breakthrough or discoveries of new mines, neither of which can be counted on, there is a serious problem of the adequacy of the flow supply for the foreseeable future. The commission will have to examine the problem.

4. The Role of Central Banks

A central bank can either enforce and speed up adjustments under the gold standard, or it can attempt to shield the domestic money supply and economy from external shocks. Provision could be made to limit the role of the central bank with respect to the operation of the gold standard but still leave it a role as a lender of last resort with respect to domestic shocks.

Under a properly functioning gold standard, the only goal that a central bank can achieve is the maintenance of convertibility. It cannot at the same time be responsible for achieving the goals of high employment, real economic growth, and productivity. Under the gold standard, the outcome for employment is whatever level is consistent with maintenance of convertibility.

5. Consequences for Economic Stability of Choosing a Form of the Gold Standard

The gold standard, of whatever form, provides long-term price stability at the cost of short-term price instability and short-term output instability, which means fluctuating employment. The short-term instability follows from the short-term adjustments that must be undertaken under the gold standard. In addition, real disturbances in one country are transmitted to the rest of the world through fixed exchange rates. A boom in one important country will

lead to an increase in demand by its residents for goods and services in the rest of the world. The opposite would happen in the case of a recession.

6. A Summary of Costs and Benefits of Adhering to a Gold Standard

<u>Costs</u>	<u>Benefits</u>
1. High resource costs	1. Long-term price stability
2. Risk of choosing the wrong fixed price of gold	2. Incentives to private market participants to make long-term contracts, which are necessary for efficient operation of a market economy
3. Short-term price instability ^a	3. Minimization of confusion between relative and price level movements, so that incidence of false signals with regard to real economic decisions declines.
4. Short-term output instability	4. Limited role of government intervention in determination of price level and overall level of economic activity
5. Short-term unemployment changes	
6. Monetary independence subordinated to international considerations	

^aOne modification of the gold standard, advocated by Irving Fisher, to offset fluctuations in the price level was a tabular standard. By a tabular standard he meant varying the gold content of the dollar so that its purchasing power would remain constant. When gold was plentiful and inflation loomed, the gold content of the dollar would be raised, that is, the price of gold would be lowered. Similarly, when gold was scarce and deflation loomed, the gold content of the dollar would be lowered, that is, the price of gold would be raised. Fisher proposed changing the dollar value of gold by a formula: every month, change the dollar price by one per cent downward for each per cent increase in the price level above a target; change the dollar price upward for each per cent decrease in the price level below a target. The tabular standard could be applied to any type of gold standard.

7. Requirements for Restoration of a Gold Standard in the United States

The basic requirement is a renewed commitment to long-term price stability, starting either from the present level of prices or from a level attained after a period of deflation. The commitment would be conditioned on an official price for gold that accurately reflected the balance between world demand for and supply of gold. Having made that choice, the United States would then undertake to maintain the price level consistent with the fixed price of gold.

If the United States returned to gold unilaterally, it could face problems arising from random shocks in the gold market. If other industrialized countries returned to gold along with the United States, the effects of a random shock in the gold market would be dissipated across all the countries. For an international gold standard to be re-established, the first requirement is the removal of the forces which caused it to break down. Disparate inflation rates among the industrialized countries led to the collapse of the Bretton Woods system. The gold standard compels countries adhering to it to adjust their price levels to the world level through the operation of the foreign exchanges. The unwillingness of low inflation countries to subordinate domestic monetary policies to the requirements of a fixed exchange rate system led to the breakdown of the Bretton Woods arrangements. This would mean that before a restoration of an international gold standard could be seriously contemplated, the disparity among rates of inflation would need to be reduced, if not eliminated. Given current rates of inflation across countries, this is obviously a formidable political and monetary goal.

8. Problems Involved in Finding the Right Price of Gold at which to Resume

This is the heart of the question of resumption. The past offers no guide in the current state of affairs, unlike the conditions prevailing in former times when the United States or other countries determined that resumption was feasible. Then there was an old price of gold that was once again restored or that served as the base for the revaluation or devaluation. There is no comparable old price today. The last official price of an ounce of gold, \$42.22, is so out of line with current market prices that it provides no guidance. The risk involved in choosing the wrong price is great. The political and social consequences of a mistake would be grave. An incorrect price might lead to a huge inflow of gold if it were too high, or a huge outflow if it were too low.

How would the United States determine the price of gold as a condition precedent to restoration of the gold standard? Economic theory tells us what market fundamentals should determine the price of gold. Some proposals exist for the determination to be made by the market. Arthur Laffer proposes that an announcement be made that some months hence, a dollar unit of the monetary base of the Federal Reserve System would be linked to a fixed quantity of gold at that day's average transaction price in the London gold market. That would become the official value of the dollar and price of gold from thenceforth on. It is hard to believe, however, that the price prevailing at the end of the announcement period would represent the price the market would otherwise establish. An alternative proposal is that the Treasury would announce its intention to resume and at the same time indicate that the private market price of gold was too high. Speculators would then drive the price down. Several possible research lines exist for an attempt to estimate the price of gold that would be appropriate, and that is the direction in which the commission may want to move.

Alternatives to a Gold Standard

1. A Commodity Standard other than Gold

Economists have long argued that a commodity reserve standard with a bundle of commodities is superior to a single commodity standard like the gold standard. The reason is that such a scheme could mitigate the price level instability produced by basing the standard on one commodity like gold. Technologically induced changes in relative costs of production of some of the bundle would be offset in the rest of the bundle.

Under commodity reserve standards, purchase from and sale of the commodities covered by the standard to the monetary authority by private individuals in theory preclude deviations in the price level over the long run. Self-interested action by individuals in the economy maintains the stability of the price level. The role of the monetary authority is limited to choosing the commodities of which the bundle consists and providing for their storage, if that is part of the scheme.

A country would issue warehouse receipts for commodity bundles that would circulate as money. A deflationary tendency would encourage production of the commodity bundle that would be exchanged for newly issued money at the fixed price, thus countering the initial tendency. An inflationary tendency would lead private individuals to redeem money in circulation in commodity bundles, thus countering that tendency.

Even a broader commodity reserve standard faces the problem of short-term price instability relative to the general price level. However, a correction similar to the one Irving Fisher advocated for the gold standard could be applied.

2. An Inconvertible Paper Standard

A review of the pros and cons with respect to the gold standard or other commodity reserve standards usually ends up with the conclusion that these standards are inferior to a sensibly managed inconvertible paper standard. Just as the 100 per cent gold standard has been diluted over the decades, so could a commodity standard other than gold. Government intervention under a commodity standard could deliberately create inflation, negating the price-stabilizing capacity of the standard. The complexities and costs of commodity standards are far greater than would exist under a properly managed paper standard.

The rub is, how to insure proper management. The Federal Reserve System has operated with discretionary powers since its establishment. The alternative would be for Congress to adopt a rule for the Reserve System to follow. One rule that has been suggested is that the quantity of money be increased at a fixed rate year-in and year-out without any variation in the rate of increase to meet cyclical changes.

If we remain on an inconvertible paper standard, the disposal of the Treasury's gold stock is a problem that needs to be studied. Some provision for a strategic stockpile of gold may be advisable. The purpose would be to insure a supply for defense-related needs. The size of the stockpile would be on the order of one-tenth of the Treasury's stock. What to do with the balance of the stock would be the question to study. Several options are available:

- a. The United States should demonetize gold, if restoration of a gold standard is ruled out. Since the market price of gold will decline as the expected rate of inflation falls, the Treasury holds a depreciating asset. Therefore, it should sell the gold it holds. However, the rate at which it does should

not disturb the gold market despite the incentive to sell at prevailing higher prices. The revenue from gold sales could be used to reduce the budget deficit.

- b. The United States should not demonetize gold because at some future date, gold convertibility might be adopted.
- c. Even if gold is not assigned the role of the determination of world price levels for the foreseeable future, gold can still be functional as a reserve asset, if repriced at a higher price than the last official price. Some agreement with our trading partners on a new price might restore an international monetary role for gold as a store of value for official institutions. The objective would be to promote trade in gold by central banks with each other. This might influence trading in private gold markets and make the price of gold more stable.

memorandum

To: Members of the Gold Commission
From: Anna J. Schwartz
Date: August 3, 1981
Subject: The Role of Gold in U.S. Experience, 1834-1981

Attached is a review of the past role of gold in the U.S. monetary system from 1834 to date. The review is headed Part Two because I anticipate that it will serve as the second part of the report of the Gold Commission. Footnotes will be added when the final draft is presented to the Commission.

The review is a guide to the path by which the United States reached its current domestic and international monetary arrangements. I regard the review as helpful in following the instruction to the Commission in P.L. 96-389 "to conduct a study to assess and make recommendations with regard to the policy of the United States Government concerning the role of gold in domestic and international monetary systems . . ."

Part Two

The Past Role of Gold in the U.S. Monetary System

From 1834 to 1973, with the exception of the years 1862 through 1878 and of an interlude of less than a year's duration in 1933-34, the United States adhered to some form of a gold standard. The purpose of this review is to examine the operation of the successive types of gold standard in U.S. experience, including the evidence for each type on the stability of the price level and of real output, as well as the intervening episodes of floating exchange rates.

Chronologically, U.S. experience with the gold standard may be characterized as follows:

1. 1834-1861: a de facto gold standard in a largely bimetallic international monetary system
2. 1862-78: the greenback standard
3. 1879-1914: a gold standard without a central bank, and a fractional reserve banking system, as part of an expanding international gold standard
4. 1914-1933: a managed gold standard, under the Federal Reserve System, which was legally obligated to maintain minimum gold reserves against its monetary liabilities, in a short-lived postwar international gold exchange standard
5. 1933-1934: a floating dollar in an international monetary system split between a depreciated sterling area and a gold bloc clinging to parity
6. 1934-1948: the interwar and World War II and immediate postwar managed gold standard in a fragmented international monetary system
7. 1948-1968: the Bretton Woods dollar/gold standard system, with progressive dilution of the gold restraints on U.S. monetary conduct
8. 1968-1973: the breakdown of the Bretton Woods system
9. 1973-1981: the United States on an inconvertible paper dollar standard.

U.S. Experience on the Gold Standard

1. 1834-61 -- a de facto gold standard

Before 1879, the United States was legally on a bimetallic standard, but from 1834 on until the Civil War suspension of specie payments, de facto it was on the gold standard. The mint ratio established by the Coinage Act of 1792 and 1792 made the dollar equivalent to 24.75 grains of fine gold/to 371.25 grains of fine silver, or a ratio of 15 to 1. The mint ratio at that time matched the market ratio. Subsequently, a great increase in Mexican silver output led to a decline in the market value of silver relative to that of gold, the ratio approximating 15 1/2 to 1. Hence silver was overvalued at the mint and relatively little gold was brought there. Instead, gold was shipped abroad where the price was higher. De facto during the period before 1834, the United States was on a silver standard.

On June 28, 1834, the Coinage Act of 1834 changed the mint ratio to 16.002 to 1, lessening the weight of a dollar to 23.2 grains of fine gold and leaving unchanged the weight of a dollar of silver. Before 1834, 100 ounces of pure gold or 1500 ounces of pure silver in coin would discharge a debt. After 1834, the debt could be paid with 94 ounces of pure gold in coin.

But since silver was undervalued at the mint, it was driven from circulation. Offering 1475.5 ounces of silver was sufficient at the market ratio to obtain 94 ounces of gold. The Coinage Act in effect debased the currency. Some supporters of the act were aware that it would drive silver out of circulation. It was indeed their objective to achieve a gold standard and a permanent circulation of gold coins. Others urged that as the value of silver relative to gold had been falling for many years before 1834, it would continue to do so in the future and therefore the mint undervaluation of the metal would soon be eliminated. That prediction was wrong.

The act of 1834 was supplemented in 1837 by a law changing the proportion of alloy to pure metal in gold to correspond to that in silver. It established the ratio of alloy at one-tenth, changing the quantity of pure gold from 23.2 to 23.22 grains. For each dollar weight in gold, there is a corresponding price of gold per fine troy ounce of 480 grains ($480/23.22 = \$20.67$). The mint ratio between silver and gold coins became 15.98 to 1 ($371.25/23.22$).

The gold discoveries in Russia, Australia, and California from 1848 on produced a fall in the value of gold, accentuating the discrepancy between the mint and the market ratios. By 1853, a silver dollar was worth about 104 cents of a gold coin, so no one would use silver in settlement of debts. Silver was used as a commodity, not as money. Since subsidiary silver coinage was proportional to the weight of the dollar piece, it also disappeared from circulation. By 1850, there was a gold standard without adequate subsidiary money for retail transactions. The demonetization of silver may be dated from the Act of 1853, rather than the customary date of 1873. The act reduced the number of grains of pure silver in 100 cents from 371.25 to 345.6, a reduction of nearly 7 per cent which exceeded the difference between the value of the gold dollar and the silver dollar. The market value of the pure silver

in subsidiary silver coins was thus less than the gold dollar (first minted in 1849; before then, only larger denominations had been coined). The face value of subsidiary coins accordingly was greater than their value as bullion. The supply of subsidiary coins was left to the discretion of the Secretary of the Treasury, and their legal tender limited to a sum not exceeding five dollars. The act also for the first time imposed a charge for seigniorage, which until then had been an expense borne by the Government, although subsidiary coins were not subject to seigniorage. (The Resumption Act of 1875 repealed the charge.)

The overvaluation of gold at the mint in 1834 that made the dollar a gold currency, when the United States was legally on a bimetallic standard, was reinforced by the gold discoveries after 1848. In France, also legally on a bimetallic standard from 1803 on, the circulation was almost exclusively silver since the market ratio was higher than the mint ratio of 15 1/2 to 1. When the gold discoveries after 1848 depressed the value of gold, as in the case of the United States, the divergence between the mint and market ratios served to shift the franc to a gold standard de facto. Only Great Britain was on a full-fledged gold standard during the period after 1821, when convertibility was restored after the Napoleonic Wars. Since Great Britain was the world's leading trading country and the London money market was the hub of international capital movements, the gold standard had international scope despite the limited number of countries formally adhering to it.

External and internal shocks interacted during the decade beginning 1834, resulting in a highly unstable performance by the U.S. economy. The chief external shock was British in origin. British eagerness to invest in the United States in the early 1830s necessitated a U.S. trade deficit, made possible by a rise in U.S. prices above those prevailing in Britain. Thanks to an inflow of specie into U.S. bank reserves, the money supply expanded, allowing U.S. prices to rise. (It is not clear that Andrew Jackson's war on the Second Bank of the United States had any independent consequences for monetary expansion.) Ultimately, loss of specie by the Bank of England led it in 1836 to restrain the capital outflow to the U.S. It raised the discount rate in July and August, refused to discount bills of exchange drawn on mercantile houses engaged in the Anglo-American trade, even at the higher rates, and as a result, produced financial pressure in the United States by early 1837.

Simultaneously with the earlier capital outflow from Britain, a surge in British demand for U.S. raw cotton triggered a land boom. Between 1833 and 1836, land sales by the Federal Government at a constant price sextupled. News of the Specie Circular in July 1836, requiring payments to land agents

in specie, concerned the Bank of England because of the implied rise in the demand for specie in the United States. Domestically, the planned distribution to ^{the} states in four equal installments (only three took place) of the surplus accumulated by the Federal Government from its land sales, starting January 1, 1837, might also have imposed a hardship on the banks as funds were transferred.

Financial pressure in the United States in early 1837 was aggravated by a fall in the price of cotton, as British demand declined. As a result, debts secured by cotton became frozen, merchants holding such debts went bankrupt, and banks with such loans in their portfolios suspended specie payments as an alternative to the repayment of debts to Britain at a fixed exchange rate. In effect, the United States devalued the dollar during the period of suspension when foreign exchange was available only at a premium.

The suspension continued for a year. In 1838, the economy revived when Britain resumed capital exports, but in 1839, loss of specie again prompted the Bank of England to raise the discount rate. As in 1837, both the supply of capital to the United States and the demand for its cotton fell. The successor Pennsylvania-chartered Bank of the United States, which had extended loans on cotton when the price was high, suspended specie payments in October 1839, followed by banks in the South and West. Nine states defaulted on their bonded indebtedness in 1841 and 1842, shutting off further capital inflows from Europe until the 1850s. Bank failures were widespread, the supply of money fell sharply, and deflation ruled, 1839-42.

Banking panics also occurred in 1847 and 1857, but only the latter one, was accompanied by restrictions on convertibility and a premium on gold.

Gold standard experience of the United States before the Civil War was

dominated by the role of the Bank of England. It imposed real adjustment costs on this country. External shocks produced boom and depression that further amplified the effects of internal shocks. Adjustment costs were the price the United States paid for maintaining a fixed exchange rate with sterling. When the costs became excessive, specie payments were suspended.

The record of the quarter-century from 1834 on reveals the magnitude of the adjustment costs. Wholesale prices at annual rates varied as follows:

1834-37 (+8 per cent); 1837-43 (-7 per cent); 1843-47 (+5 per cent);

1847-49 (-5 per cent); 1849-55 (+5 per cent); 1855-61 (-4 per cent).

The estimates of real output for the period 1834-59 are not continuous with the post-Civil War estimates. At annual rates, they also suggest not much greater stability than in wholesale prices:

1834-36 (-1 per cent); 1836-39 (+6 per cent); 1839-40 (-1 per cent);

1840-53 (+6 per cent); 1853-54 (-4 per cent); 1854-59 (+4 per cent).

2. 1862-1878 -- the greenback standard

Early in 1862, convertibility of Union currency into gold was suspended as a result of money creation in the North to help finance the Civil War, disturbances in foreign trade, the general uncertainty arising out of the war, and the borrowing techniques of the Treasury. From then until resumption of specie payments on January 1, 1879, the United States was legally on a fiduciary standard -- the greenback standard. Despite support for inconvertible currency by many business groups before and during the war, and growing farm support after the war, as agricultural prices fell, suspension of payments was generally regarded as temporary.

During suspension, greenbacks circulated side by side with gold, with the price of gold in terms of greenbacks varying from day to day. A floating rate of ~~ex~~change existed between the two currencies. The major monetary use ~~of~~ of gold ~~was~~ for foreign transactions. For foreign payments, gold was equivalent to foreign exchange, since Great Britain in particular maintained a gold standard. Dealers as well as others having extensive foreign transactions therefore found it convenient to maintain gold balances as well as greenback balances. To accommodate them, New York banks, and perhaps others as well, had two kinds of deposit accounts: the usual deposits payable in greenbacks or their equivalent, and special deposits payable in gold. The gold deposits were expressed in "dollars" like the greenback deposits, but that dollar stood for the physical amount of gold that had corresponded to a dollar before the Civil War and was to again after 1879. During the period of suspension, this physical amount of gold was worth more than a dollar in greenbacks -- it was worth well over two dollars in greenbacks from mid-1864 to early 1865.

Gold also retained an appreciable, though minor role, in domestic payments. Customs duties were payable in gold. In addition, the Treasury made virtually all interest and principal payments on its debt in gold at the pre-Civil War monetary value. Some private debt instruments required payment of interest or principal in gold. Finally, the West Coast remained largely on a specie basis. In the rest of the country, prices were quoted in greenbacks, and gold offered in payment was valued at its current market premium in greenbacks. On the West Coast, by contrast, prices were quoted in gold, and greenbacks offered in payment were valued at their current market discount in gold.

Before the Civil War, the exchange rate between the U.S. dollar and the British pound varied around \$4.86 within a narrow interval determined by the costs of shipping gold. From 1862 on, the exchange rate was not so limited

and moved far outside those limits. It was determined by the demand for and supply of foreign exchange, and there were no legal commitments on the part of the United States that prevented the exchange rate from taking any value that was necessary to balance international payments.

The essential requirements for a return to the prewar parity was that the exchange rate so determined be within the initial range determined by the gold points. Once the Civil War was over, the most important factor affecting the exchange rate between the U.S. dollar and the British pound was the movement of internal prices in the United States relative to prices in Britain. A drastic decline in U.S. prices between 1867 and January 1879 made resumption possible. The price index fell at the rate of 5.4 per cent per year. Over the same period, the quantity of money rose at the rate of 1.3 per cent per year. An exceedingly rapid rise in output was the primary factor producing the decline in prices.

Specie resumption was a major political objective of the period and the question whether the government was proceeding toward this objective too rapidly or too slowly was a major political issue. Government action played a minor, if crucial, supporting role in contributing to successful resumption. It may have contributed to the rapid expansion of output through its policies on sale of public land, land grants to railroads, and other similar measures which contributed to the expansion of the West. But such government action was not of the kind that anyone at the time or since would have regarded as explicitly directed toward achieving resumption.

Government action had mixed effects on the mild rate of growth of the quantity of money outstanding. On the one hand, federal and state legislation laid the foundation for the rapid growth of commercial banking, particularly state banks after 1867, that produced increases in the ratios of deposits to reserves and deposits to currency. In addition, the elimination of reserve

requirements against national bank notes in 1874 liberated reserves that encouraged a rise in the deposit-reserve ratio. The rises in the deposit ratios tended to increase the quantity of money outstanding, and thereby to inhibit price declines and to postpone the achievement of the prerequisites for successful resumption. On the other hand, the government did succeed in bringing about a minor reduction in the stock of high-powered money, mostly through use of government surpluses and debt refunding operations to retire Civil War currency issues from 1865 to 1869, and it thereby helped offset to a limited extent the effect of the rises in the deposit ratios.

In view of the recurrent political pressures to expand the greenback issues -- to which the government in fact yielded in 1873-74 -- and the political difficulty then as now of obtaining budget surpluses to retire debt, the achievement of even a minor decline in high-powered money was not a negligible accomplishment.

The Resumption Act of January 14, 1875, which announced the intention to resume specie payments at the prewar parity on January 1, 1879, contained a variety of provisions designed to appeal to silver advocates (replacement of fractional currency -- a Civil War paper issue -- by silver coins); paper-money advocates (removal of existing limits on the aggregate issue of national bank notes and linking the retirement of greenbacks -- the aggregate outstanding not to fall below \$300 million -- to the increase in national banknotes; for every five dollar increase in national bank notes the Treasury was to retire four dollars in greenbacks); gold standard advocates (its main provisions). The act authorized the Secretary of the Treasury both to use surplus revenue and to sell bonds in order to accumulate a gold reserve. At the time, the act was little more than the expression of a pious hope and, insofar as it had any contemporary effect, it was to heighten the opposition to resumption.

That opposition was reflected in the free silver movement that arose in the mid-1870s. The silver commission that was formed late in 1876 by a joint resolution of Congress presented a year later one majority and two minority reports. The majority argued against resumption as "not practicable under the circumstances, until the laws making gold the sole metallic legal-tender are repealed." Some of the majority recommended the old silver dollar of 412.5 grains; the rest recommended a legal relationship between silver and gold of 15.5 to 1 instead of the old relationship of 15.98 to 1, achievable either by reducing the silver content of the silver dollar to 399.9 grains or by increasing the gold content of the gold dollar. They favored the former inflationary effect. One minority report rejected silver as unsuitable for a standard of value but recommended devaluation of the gold dollar by about 2.6 per cent. The second minority report supported the principle of silver remonetization only on condition that an international conference would accept silver as a universal legal tender. There was clearly a range of views on the proper monetary standard, with some diehard attitudes toward resumption at the pre-Civil War parity. Late in 1877, the House passed a bill to repeal the Resumption Act. The bill was defeated in the Senate by one vote. This paper-thin decision turned out to be politically decisive.

The decline in the quantity of money in the last few years before resumption, which helped foster the particularly rapid price decline of those years, in part owed something to the decline in the two deposit ratios associated with bank suspensions in 1877-78, in part to the influence of the Resumption Act. The interpretation of the clause in the Resumption Act requiring a proportionate withdrawal of greenbacks for new national bank notes served to contract the greenback circulation because the voluntary surrender of national bank notes issues by banks retiring their notes was not deducted from the gross increase by other banks.

Both before and immediately after resumption, the Treasury in its re-funding operations went to great lengths to avoid the introduction of even temporary disturbances of any magnitude in the foreign exchange market. In 1877-79, the Treasury refunded about half the average outstanding interest-bearing public debt, to take advantage of lower rates of interest. For foreign holders of securities, calls of old bonds were so timed that one collection of securities was replaced by another or, if offsetting sales of new bonds were not possible, surplus from current account was available to pay for old bonds retired without export of U.S. gold. During these years, in fact, the United States was a net importer of over \$5 million in gold, despite a repatriation of over \$300 million of U.S. government securities by foreigners.

The Resumption Act, and the borrowing and accumulation of a specie reserve under its provisions, had three effects, working in different directions, on resumption.

1. Insofar as the act and the specie reserve instilled confidence in the prospective maintenance of specie payments, it inhibited either a speculative withdrawal of funds from the United States or a speculative accumulation of specie, and enhanced the willingness of foreigners to hold U.S. dollar balances. Had there been no Resumption Act, repatriation by foreigners of U.S. securities in 1876-78 might well have been even greater than it was. More important, by setting a definite exchange rate that was to be attained and a definite date at which it was to be attained, the act offered those speculators with confidence that the government would in fact succeed in achieving those aims an incentive to proceed so as to hold it there. In fact, the monthly average premium on gold dropped below 2 per cent by March 1878 and never thereafter rose above that level. This effect clearly favored resumption.

2. The sale of bonds was an open market operation. The sale of bonds at home for gold was equivalent to selling bonds for greenbacks and then using the proceeds to purchase gold, with the effect of an open market purchase combined with an equivalent open market sale, the two together leaving the total monetary base unaffected. In practice, though gold was not the legal standard, it was used for monetary purposes alongside greenbacks. In consequence, insofar as the gold purchased came from gold held for monetary purposes by either the domestic public or the domestic banks, it did, in the first instance, reduce the reserve basis of the system. However, the banks and others could always replace gold holdings, if they so wished, by purchasing gold or its equivalent, sterling, in the free market at home or abroad and, in fact, that is what happened. The increase in the Treasury's gold reserves was not appreciably at the expense of the high-powered money holdings of the public or the banks.

3. Since gold was the equivalent of foreign exchange, the Treasury's purchase of gold constituted an increase in the demand for foreign exchange. Insofar as it borrowed abroad resources that would otherwise not have been available for loans to this country, it increased the supply correspondingly. But some of its borrowing abroad must have been at the expense of other lending to this country (lending was going on even though the net capital movement from this country was outward); to that extent, the supply was increased less than the demand even by foreign borrowing. Borrowing at home had this effect to an even greater extent. By borrowing at home, the Treasury acquired resources that would have been used in other ways, some of which might have involved a demand for foreign exchange. At most, however, only part of the resources would have been used to purchase foreign exchange, whereas the Treasury used all of them in this way. The result of the greater increase in demand than

in supply was to make the greenback price of sterling higher than it otherwise would have been. The effect therefore made resumption more difficult; it required, that is, a decline in domestic prices sufficient not only to balance foreign payments on current account at the desired exchange rate but also to produce a large enough surplus to finance the accumulation of the specie reserve. Whether the Resumption Act on balance hindered or helped resumption therefore depends on whether this effect was more or less important than the effects on confidence and speculation, and on the growth of high-powered money.

Whatever the conclusion on this score, the cessation of government borrowing to build up a gold reserve, once resumption had taken place, removed a source of pressure on the exchange rate and permitted domestic prices to rise sharply immediately after resumption, without producing balance-of-payment problems.

3. 1879-1914 -- a gold standard without a central bank

The success of resumption did not end uncertainty about the monetary standard. For nearly two decades thereafter, the U.S. financial scene was dominated by controversy, which had started in the seventies, over the place of silver in the monetary system.

The rapid expansion of output in the Western world during those decades and the adoption of a gold standard over an area far wider than before added substantially to the demand for gold for monetary purposes at any given price level in terms of gold. That expansion in demand more than offset a contemporary expansion in supply, as a result both of increased production of gold and improvement of financial techniques in erecting a larger superstructure of money on a given base of gold. The result was a slow but rather steady downward tendency in product prices that prolonged and exacerbated the political discontent initiated by the rapid decline in prices after the end of the Civil War. "Greenbackism" and "free silver" became the rallying cries. The silver

forces were strong enough to obtain concessions that shook confidence in the maintenance of the gold standard, yet they were not strong enough to obtain the substitution of silver for gold as the monetary standard. The monetary ^{one} history of this period is therefore/of repeated crises and of legis-lative backing and filling. The defeat of William Jennings Bryan in the Presidential election of 1896 marks in retrospect the end of the period.

Bryan's defeat happened to follow gold discoveries in South Africa and Alaska and the perfection of the cyanide process for extracting gold. These developments produced a rapid expansion of the world's production of gold, sufficiently large to force an upward price movement over the next two decades despite a continued growth in world output. The accompanying gradual rise in prices rendered the gold standard secure and unquestioned in the United States until World War I.

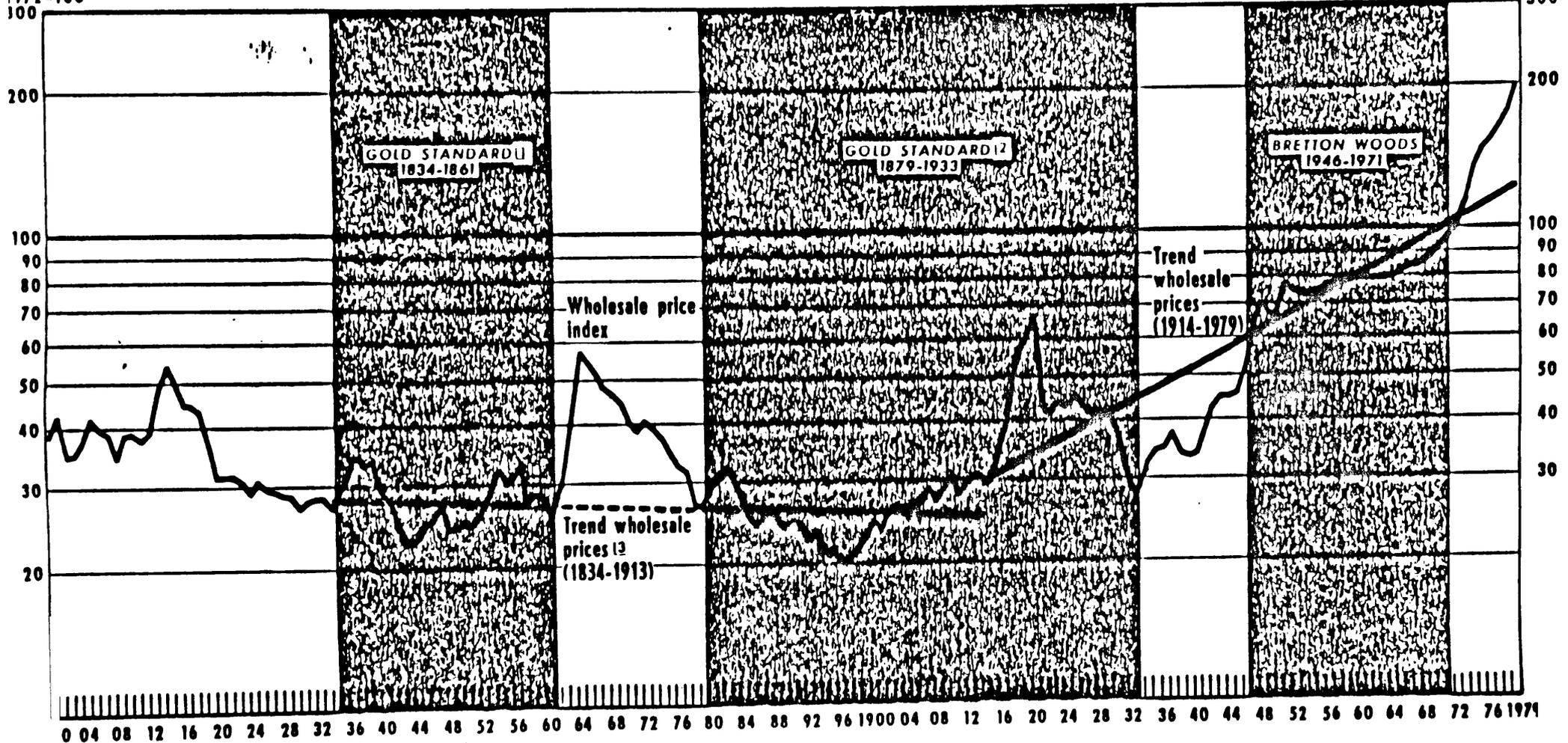
Monetary disturbances during the period from 1879 to 1914 were associated with banking difficulties in 1873, 1884, 1890, 1893, and 1907. Under a fractional reserve banking system, the public's withdrawal of currency from the banks not only reduced the banks' reserves but also produced a multiple contraction in deposits. In some episodes, as in the period 1834-1861, the banks restricted convertibility of deposits into currency. As a consequence, currency sold at a premium, which was equivalent to a depreciation of the deposit dollar in terms of gold or foreign exchange. These monetary disturbances, however, were attributable to the U.S. banking structure rather than the gold standard system. The need for reform of the banking structure was widely acknowledged after 1907.

To form a judgment about U.S. experience under the gold standard, we can examine from 1870 the behavior of prices and of real per capita output (Figures 1 and 2), and from 1879, of the monetary gold stock and the purchasing power of gold (Figure 3). (Figures follow on pp. 15a, 15b, 15c.) The

Figure 1
Wholesale Price Index, United States

Ratio scale
1972=100
100

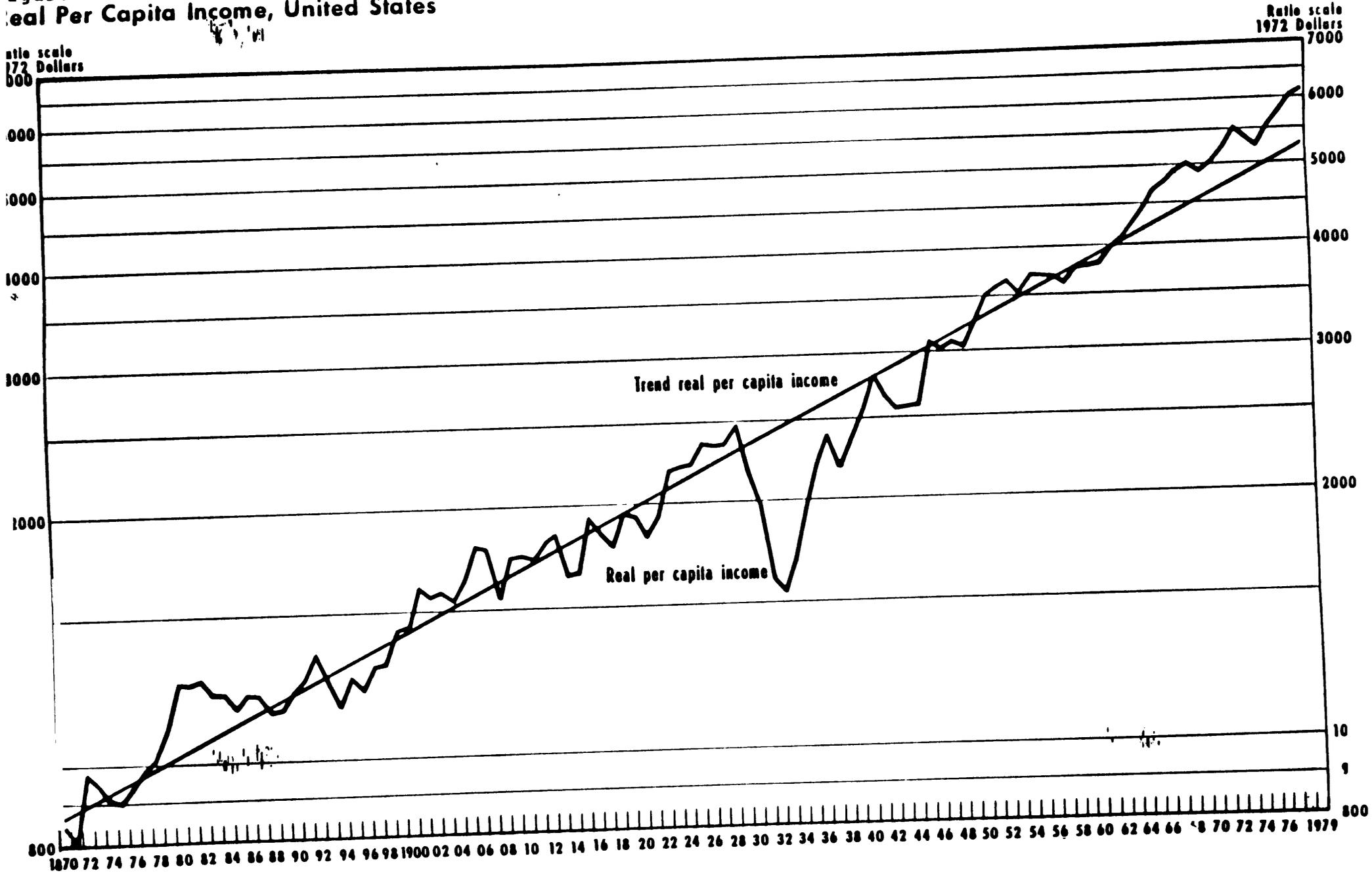
Ratio scale
1972=100
300

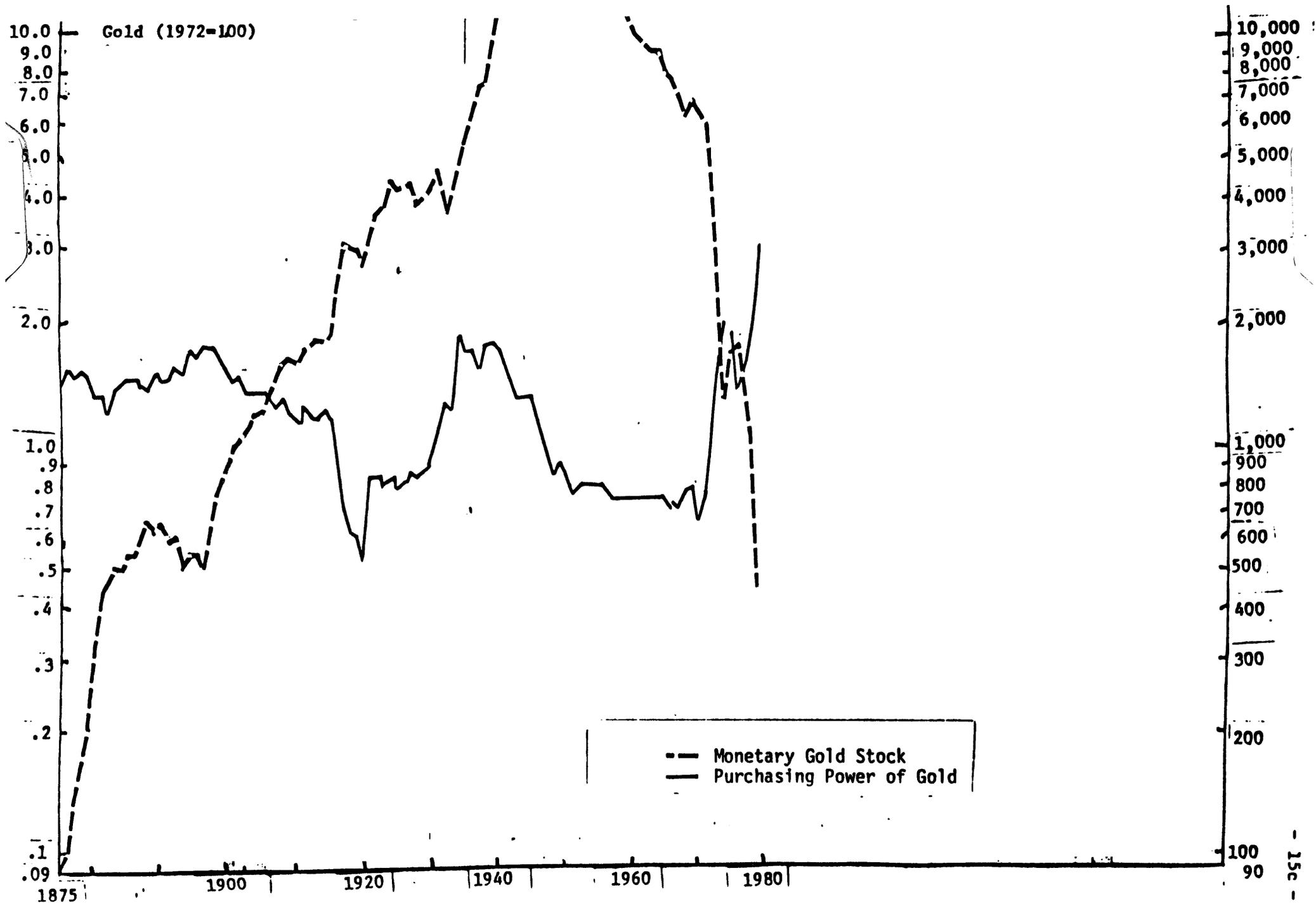


includes 1838-1843 when specie payments were suspended.
United States imposes gold export embargo from September 1917 to June 1919.
broken line indicates years excluded in computing trend.

Prepared by Federal Reserve Bank of St. Louis

Figure 2
Real Per Capita Income, United States





trend of the wholesale price index for the period 1834-61 and 1879-1914 was slightly downward, with a marked degree of variance about the trend. Despite a sharp decline in the annual estimates from 1890 to 1896, the trend of the U.S. monetary gold stock was positive from 1879 to 1914. The trend of the purchasing power of gold was negative (a rising price level), reflecting the more rapid growth in U.S. monetary gold than in real output over that period. Deviations from trend in the monetary gold stock were negatively associated with deviations from trend in the purchasing power of gold, with some tendency for the purchasing power deviations to lead the monetary gold stock deviations. This would be consistent with a tendency for the price level to revert towards a long-run stable value under the pre-World War I gold standard, though over the short run inflation or deflation was experienced.

As might be expected, the trend of U.S. real per capita income was strongly positive from 1870 to 1914, but with substantial variance about the trend.

In sum, contemporaries regarded the pre-World War I gold standard as a successful commodity standard, international in scope from the late nineteenth century on. It provided long-run stability despite short-term price instability. Years might elapse before a tendency to decline or rise in the price level was reversed. Real output growth around a rising trend was not steady but the instability was attributed to special features of the U.S. banking structure.

Relative to Great Britain, the United States was only a small country in the world economy. The Bank of England dominated the world economy, influencing international flows of capital, managing the gold standard on a narrow gold base

so that the rest of the world had to keep in step with its actions. With the monetary systems of many countries linked together through fixed exchange rates, international payments imbalances led to movements in money supplies, price levels, the relative prices of exports and imports, incomes and interest rates.

The extent to which these results were due to relative international peace, relatively free international trade, factor mobility within and across countries, the concentration of world capital and money markets in London, and the willingness of gold standard countries to maintain fixed parities can be judged by comparison with the absence of these conditions in the post-World War I decades.

4. 1914-1933 -- a managed gold standard

The Federal Reserve Act was passed in 1913 under peacetime conditions when it was taken for granted that the gold standard would prevail. The Act included a gold standard rule incorporated in gold reserve requirements for Federal Reserve notes and deposits and also a "real bills" rule, according to which the criterion for determining the quantity of money would be linked to "notes, drafts, and bills of exchange arising out of actual commercial transactions" (section 13), offered for discount at rates to be established "with a view of accommodating commerce and business" (section 14d). Both were regarded as quasi-automatic in their operation. Taken literally, the two rules were contradictory. Maintenance of the gold standard means that the stock of money must be whatever is necessary to balance international payments. The real bills rule sets no effective limit to the quantity of money.

The act was no sooner passed than the conditions taken for granted ceased to hold. Before the System began operations in November 1914, World War I had begun. Very soon the belligerents effectively left the gold standard and

a flood of gold started coming to the United States to pay for purchases by the Allies. Between September 1917 and June 1919 the United States controlled gold exports by export licenses and in effect suspended interconvertibility between paper money and gold. The gold standard criterion set a largely ineffective limit on the total quantity of money. A worldwide gold standard was re-established for a brief period in the 1920s, yet the gold standard never again played the role that the framers of the act took for granted. The real bills criterion fared no better. Once the United States entered the war, loans on government securities began to rival commercial paper as collateral for Reserve Bank rediscounts. The Reserve System was authorized to issue notes against rediscounted assets other than commercial paper, mainly members' 15-day notes secured by government bonds. Thus the Federal Reserve System began operations with no effective legislative criterion for determining the quantity of money.

This conclusion can be documented by comparing the actual course of events with what would have happened under a fully operative gold standard. The war-time experience under a gold standard might not have differed from what actually occurred: the large inflow of gold up to the entry of the United States into the war would have produced a price rise through 1918 similar to actual experience. The big difference would have emerged between the end of the war and 1920 when nearly half of the monetary expansion from 1914 on occurred because the Federal Reserve subordinated monetary policy to the alleged necessity for facilitating Treasury funding of the floating debt plus unwillingness to see a decline in the prices of government bonds. The monetary expansion and the accompanying inflation led to an outflow of gold after the lifting of the embargo despite the great demand abroad for U.S. exports and despite the departure of most countries from a fixed parity between their

currencies and either gold or the dollar. The ensuing decline in the reserve ratio of the Federal Reserve System finally compelled action to slacken monetary growth. The initial action -- a sharp rise in discount rates in January 1920 -- produced a reversal of the gold outflow in May. The following action -- a second rise in discount in June 1920 rates to the highest level in Federal Reserve history until 1973 -- was a deliberate act of policy involving a reaction stronger than was needed, since a gold inflow had already begun. It was succeeded by a heavy gold inflow and a negative rate of monetary growth over the following year. Wholesale prices were nearly halved by June 1921 from their level in May 1920. Real output fell precipitously.

The postwar increase in the quantity of money occurred because the Reserve System did not observe the rules of the gold standard but exercised discretion. The subsequent collapse occurred because the power to manage money was not limited by the requirement to maintain gold reserve requirements. Had there been no discretion, neither the postwar increase, nor the postwar collapse need have occurred.

The price and output movements of the post-World War I years in this country were part of a worldwide movement. Throughout most of the world, for victors, vanquished, and neutral alike, prices rose sharply before or into 1920 and fell sharply thereafter. About the only countries that escaped the price decline were those that were to experience hyperinflation. Though many national currencies were not rigidly tied either to gold or to the dollar, central bank policies nevertheless produced linkages sufficiently strong to result in common movements of prices in most national currencies. Flexible exchange rates were regarded as a temporary expedient pending return to gold, and monetary authorities everywhere sought to facilitate such a return

to fixed parities. The results under managed fiduciary currencies were therefore similar to those that would have been experienced with fixed parities.

During the balance of the 1920s, the Federal Reserve System did not permit gold movements to affect the quantity of money outstanding. Inflows were offset by open market sales, outflows, by open market purchases. Federal Reserve credit after 1923 moved inversely with movements in the gold stock. The System achieved stable economic growth with falling wholesale prices, but this achievement was largely at the expense of economic stability in Great Britain and the peripheral countries tied to sterling. Britain's return to gold in 1925 at a parity that overvalued sterling would have caused her less difficulty if prices in the United States had risen instead of falling thereafter. The United States would then have gained less gold or lost some, and the pressure on the pound would have been eased. When France returned to gold at a parity that undervalued the franc and also did not permit gold inflows to affect its money stock and prices, the British position was further undermined.

The monetary standard to which most countries had returned by 1929 was the gold-exchange standard. They kept their monetary reserves in the form of balances of other currencies convertible into gold at fixed prices, notably sterling and dollars, rather than in the form of gold itself. Official agencies in such countries, usually the central banks, often fixed exchange rates directly by standing ready to buy or sell the national currency at fixed rates in terms of other currencies, rather than indirectly by standing ready to buy or sell gold at fixed prices in terms of the national currency.

Since the gold-exchange standard, like the gold standard, involved fixed exchange rates, it also meant that, so long as the standard was maintained, prices and incomes in different countries were intimately connected. They had

to behave so as to preserve a rough equilibrium in the balance of payments among countries. The gold-exchange standard, however, made the international financial system more vulnerable to disturbances because it raised the ratio of claims on gold available to meet those claims.

The links forged by fixed rates of exchange ensured a worldwide decline in income and prices after 1929. The evidence is clear that the United States was in the van of the movement and not a follower. If declines elsewhere were being transmitted to the United States, the transmission mechanism would be a balance of payments deficit in the United States as a result of a decline in prices and incomes elsewhere relative to prices and incomes in the United States. That decline would lead to a gold outflow from the United States which, in turn, would tend -- if the United States followed gold-standard rules -- to lower the stock of money and thereby income and prices in the United States. However, the U.S. gold stock rose during the first two years of the 1929-33 contraction and did not decline, demonstrating that other countries were being forced to adapt to our monetary policies rather than the reverse.

The international effects were severe and the transmission rapid, not only because the gold-exchange standard had rendered the international financial system more vulnerable to disturbances, but also because the United States did not follow gold-standard rules. The Federal Reserve did not permit the inflow of gold to expand the U.S. money stock. It not only sterilized it, it went much further. The U.S. quantity of money moved perversely, going down as the gold stock went up. In August 1929, at the start of the business contraction, the U.S. quantity of money was 10.6 times the gold stock; by August 1931, it was 8.3 times the gold stock. The result was that other countries not only had to bear the whole burden of adjustment but also were faced with continued additional disturbances in the same direction, to which they had to adjust.

The effects first became severe in those countries that had returned to gold with the smallest actual gold reserves, and whose financial structure had been most seriously weakened by World War I -- Austria, Germany, Hungary, and Rumania. To shore up the financial systems of those countries, international loans in which the Reserve System participated, were arranged. But so long as either the basic pressure on those countries deriving from deflation in the United States was not relieved, or the fixed exchange-rate link which bound them to the U.S. dollar was not severed, such assistance was at best a temporary palliative. In country after country, that is what it proved to be. As they experienced financial difficulties, the United States was in turn affected by the reflex influence of the events it had set in train.

The first major country to cut the link was Britain, after runs on sterling precipitated by France and the Netherlands. Britain abandoned the gold standard in September 1931. The international monetary system split in two, one part following Britain to form the sterling area; the other following the United States, in the gold bloc. The trough of the depression in Britain and in other countries that accompanied Britain in leaving gold was reached in the third quarter of 1932.

In the two weeks following Britain's departure from gold, central banks and private holders in a number of foreign countries converted substantial amounts of their dollar assets in the New York money market to gold. The U.S. gold stock declined by the end of October to about its level in 1929. The Federal Reserve System, which had not responded to an internal drain from December 1930 to September 1931 as a series of runs on banks, bank failures, and shifts from bank deposits to currency by anxious depositors produced downward pressure on the U.S. quantity of money, responded vigorously

to the external drain. A sharp rise in discount rates ended the gold drain temporarily but intensified bank failures and runs on banks. In 1931, unlike the situation in 1920, the System's reserve ratio was far above its legal minimum. The System overreacted to the gold outflow and magnified the internal drain.

The Federal Reserve System justified its passivity in relation to the internal drain by reason of a shortage of free gold. The law specified that the System hold against Federal Reserve notes outstanding, the volume of which had increased with the internal drain, a reserve of 40 per cent in gold and additional collateral of 60 per cent in either gold or eligible paper (which consisted of commercial, agricultural, or industrial loans, or loans secured by U.S. government securities rediscounted by member banks; loans to member banks secured by paper eligible for rediscount or by government securities; and bankers' acceptances, i.e., "bills bought" in Federal Reserve accounting terminology). Because the System did not have enough eligible paper to furnish 60 per cent of the collateral for Federal Reserve notes, part of the gold in excess of minimum requirements had to be pledged for this purpose. The amount of gold not needed to meet either minimum gold requirements or collateral requirements was therefore less than the amount of excess gold reserves. The Federal Reserve System asserted that the shortage of free gold was an important factor preventing the System from engaging in open market purchases. Such purchases would have reduced eligible paper holdings still further by reducing rediscounts and therefore could have been conducted only to a very limited extent without eliminating free gold entirely. Whatever the validity of the Federal Reserve view, the Glass-Steagall Act of February 27, 1932, disposed of that problem by permitting government bonds in the Reserve Banks' portfolios as well as eligible paper to serve as collateral against Federal Reserve notes in addition to the 40 per cent minimum gold reserve.

The downward movement of money, income, and prices in the United States was reversed for a few months in the second quarter of 1932, when the Federal Reserve finally undertook a program of open market purchases, following which there was a widespread revival in the real economy in the summer and fall. The termination of the program during the summer was followed in the six months from October 1932 by mounting banking difficulties, leading to state banking holidays. By February 1933, fears of a renewed foreign drain added to the general anxiety. For the first time, also, the internal drain partly took the form of a specific demand for gold coin and gold certificates in place of Federal Reserve notes or other currency. The Federal Reserve System reacted as it had in September 1931, raising discount rates in February 1933 in reaction to the external drain but not seeking to counter either the external or internal drain by extensive open market purchases. In the first few days of March, heavy drains of gold, both internal and external, reduced the New York Federal Reserve Bank's reserve percentage below its legal limit. With some reluctance, the Federal Reserve Board suspended reserve requirements for thirty days. On March 4, the Federal Reserve Banks remained closed as did all the leading exchanges. A nationwide banking holiday was proclaimed after midnight on March 6 by the incoming administration. All banks were closed until March 9 and gold redemption, gold shipments abroad or dealing in foreign exchange were suspended during the bank holiday. The Emergency Banking Act of March 9, 1933, granted the President emergency powers over banking transactions and over foreign exchange dealings and gold and currency movements. The next day, March 10, the President issued an executive order extending the restrictions on gold and foreign exchange dealings beyond the banking holiday proper and, in effect, prohibiting gold payments by banking and nonbanking institutions alike, unless permitted

by the Secretary of the Treasury under license. These measures were the precursors to a far-reaching alteration in the legal structure of the monetary standard.

5. 1933-1934 -- a floating dollar

Despite the effective suspension of gold payments in March 1933, the price of gold or the rate of exchange between the dollar and currencies that remained rigidly linked to gold, hovered around "par" for over a month. The suspension was regarded as part of the banking emergency and hence expected to be temporary; foreign exchange transactions were strictly controlled and limited; the administration made no official announcement that it proposed to permit the dollar to depreciate or be devalued; and after some weeks, several licenses to export gold were granted. Moreover, the technical gold position was sufficiently strong so that there was little doubt the preceding gold parity could have been maintained if desired; the ratio of the gold stock to the total stock of money was higher than at any time since 1914.

One important step, unprecedented in the United States, was taken during this period. On April 5, an executive order forbade the "hoarding" of gold and required all holders of gold, including member banks of the Federal Reserve System, to deliver their holdings of gold coin, bullion, or certificates to Federal Reserve Banks on or before May 1 except for rare coins, reasonable amounts for use in industry and the arts, and a maximum of \$100 per person in gold coin and gold certificates. The gold coin and gold certificates were exchanged for other currency or deposits at face value, and the bullion was paid for at the legal price of \$20.67 per fine ounce. The "nationalization" of gold outside Federal Reserve Banks was later completed by order of the Secretary of the Treasury, dated December 28, 1933, excepting only rare coins and a few other minor items from the requirement that all

gold coin, gold bullion, and gold certificates be delivered to the Treasurer of the United States at face value corresponding to the legal price of \$20.67 per fine ounce. The expiration date for the surrender of gold was later set as January 17, 1934, when the market price of gold was in the neighborhood of \$33 per fine ounce.

An executive order of April 20, 1933, extending and revising the gold embargo, and comments by the President at his news conference the preceding day ended the period of stability in the price of gold. The President made it clear that the administration intended to permit the dollar to depreciate in terms of foreign currencies as a means of achieving a rise in domestic prices. The order applied the restrictions on foreign exchange transactions not only to banks licensed under the executive order of March 10, but also to all persons dealing in foreign exchange. On the same day, the Thomas amendment to the Agricultural Adjustment Act was offered in Congress. The amendment enacted into law on May 12, and explicitly directed at achieving a price rise through the expansion of the money stock, contained a provision authorizing the President to reduce the gold content of the dollar to as low as 50 per cent of its former weight. The dollar price of gold immediately started rising, which is to say that so also did the dollar price of foreign currencies, including those like the French franc that remained on gold and those like the pound sterling that had gone off gold at an earlier date. In the next three months, the market price of gold rose to \$30 an ounce, and thereafter fluctuated erratically between a low of about \$27 and a high of nearly \$35 until January 30, 1934, when the Gold Reserve Act was passed. During that period, the United States had a floating exchange rate determined in the market from day to day, as in the period from 1862 to 1879. However, there was considerably greater government interference in the market. On

September 8, 1933, an official gold price, to be fixed daily at the estimated world market figure less shipping and insurance cost, was established. The Treasury agreed to buy gold at that price to give American miners a price as high as they could have obtained by export in the absence of the export embargo.

Starting in October, the government intervened actively to raise the price of gold. The Reconstruction Finance Corporation was authorized to buy newly mined domestic gold from October 25 on, and a few days later, through the agency of the Federal Reserve Banks, to buy gold abroad. The purchase price was raised almost daily. For a time, the large-scale RFC purchases abroad made the announced price for newly-mined domestic gold the effective market price. From the end of November, however, until the end of January 1934, the announced price exceeded the market price abroad.

The aim of the gold policy was to raise the prices of farm products and raw materials. Most farm products and raw materials exported by the United States had a world market, hence the decline in the foreign exchange value of the dollar meant a roughly proportional rise in the dollar price of such commodities as cotton, petroleum products, leaf tobacco, wheat, and similar items.

The decline in the foreign exchange value of the dollar was initially a product of speculative sale of dollars in the expectation of devaluation -- a short-term capital outflow. The decline was sustained by shifts in the demand schedules for imports and the supply schedules of exports produced by the cessation of internal deflation. Prices rose in the United States relative to prices in other countries. If the exchange value of the dollar had not fallen, the price rise would have discouraged exports and encouraged imports. These forces were subsequently reinforced by U.S. purchase of gold at home and abroad.

U.S. purchase of gold involved a reduction in the supply of goods for export, since gold is a potential export good, and hence a reduction in the demand for dollars by holders of other currencies (to buy the domestically produced gold). The purchase of foreign gold involved an increase in the demand for goods for import (namely, gold) and hence in the supply of dollars offered in exchange for foreign currencies (to buy foreign gold). The combined effect was to create a potential deficit in the U.S. balance of payments at the former exchange rate. Given a flexible rate, the potential deficit was closed by a depreciation of the dollar sufficient to generate, through an increase in exports or a decline in imports or a movement of speculative funds, an amount of foreign currencies exceeding the amount demanded for other purposes by enough to pay for the gold.

These effects depended very little on the fact that gold was the commodity purchased. Given a floating exchange rate, essentially the same effects on the dollar prices of internationally traded goods would have followed from the same dollar volume of government purchase of wheat or perfume, or from the economically equivalent program, adopted after World War II, of building up stockpiles of foreign-produced strategic goods. As it was, the use of gold as the vehicle necessarily meant an accumulation of gold, just as the use of wheat or perfume would have meant the accumulation of that commodity.

The choice of gold as the vehicle did have an important effect on the impact of the program on foreign countries. In the first place -- and a corresponding effect would be present for any particular commodity -- the program had a special impact on gold-producing countries. In the second place -- and this effect would be present only for a commodity serving as the basis of a monetary standard -- it had a special impact on gold-standard countries. Being committed to sell gold at a fixed price in terms of their

own currency, these countries necessarily experienced pressure on their gold reserves, which in turn necessitated either abandonment of the gold standard or internal deflationary pressure. Those countries were placed in the position of having to adjust downward their whole nominal price level.

The device used to achieve a decline in the exchange value of the dollar -- borrowing funds (through the issue of RFC securities) to purchase gold -- was not unprecedented. The identical device was employed before 1879 but that time for precisely the opposite purpose: to promote a rise in the exchange value of the dollar. As noted above, the mechanical as opposed to the psychological effects of the accumulation of a gold reserve rendered resumption more rather than less difficult.

A major obstacle to using gold as a vehicle for lowering the exchange value of the dollar and thereby raising prices was the existence of the so-called gold clause in many government and private obligations and in private contracts. That clause, whose use dated back to the greenback period after the Civil War, required payment either in gold proper, or in a nominal amount of currency equal to the value of a specified weight of gold. It was designed precisely to protect lenders and others against currency depreciation. This clause, if honored, would have multiplied the nominal obligations of the federal government and of many private borrowers for interest and principal of debt by the ratio of the new price of gold to the old price of gold. Accordingly, a joint resolution was introduced in Congress on May 6 and passed on June 5, 1933, abrogating the gold clause in all public and private contracts, past and future. In February 1935, the Supreme Court, by a five-to-four decision, in effect upheld the constitutionality of that resolution. Not until the act of October 28, 1977, was the prohibition against gold clauses removed, and express allowance for their use provided.

At the outset, the gold policy was one of two mutually inconsistent policies with respect to the monetary standard simultaneously pursued by President Roosevelt. The other was the organization of a World Monetary and

Economic Conference which convened in London, June 1933. President Hoover had set in train the arrangements for the convocation of the conference in May 1932, and it was originally scheduled to be held in January 1933. The aim of the conference was to achieve cooperative action on international economic problems, and hopes were high that it would produce an agreement stabilizing foreign exchange arrangements. But the conference was nearly a complete failure. One reason was that, while it was in process, the President apparently decided definitely to adopt the path of currency depreciation. He sent a message to the conference on July 2, 1933, which dissociated the United States from any attempt to achieve what was described as a "temporary and probably an artificial stability in foreign exchange on the part of a few large countries" and was termed a "specious fallacy." The message was at the time given much of the public blame for the failure of the conference. However, whatever the President might have said and however consistent U.S. policy might have been, it seems dubious that the economic preconditions existed for a viable exchange stabilization agreement. The fundamental difficulties were the probable incompatibility of the exchange rates of the sterling bloc and of the nations that still remained on gold, and the unwillingness at the time of the gold-bloc countries to change their gold parities.

The period of a variable price for gold came to an end on January 31, 1934, when the President, under the authority of the Gold Reserve Act passed the day before, reduced the gold content of the dollar to 13.71 grains and thus specified^a buying and selling price of \$35 an ounce for gold ($480/13.71 = \35). He thereby devalued the gold dollar to 59 per cent of its former weight. Under the terms of the act, title to all gold coin and bullion was to be vested in the United States; all gold coins were to be withdrawn from circulation and melted into bullion and further gold coinage was to be discontinued; the

Secretary of the Treasury was to control all dealings in gold; and the President was authorized to fix the weight of the gold dollar at any level between 50 and 60 per cent of its prior legal weight.

Since the Treasury had formerly valued its own gold holdings at \$20.67 an ounce, and paid only that price for gold it acquired from private individuals, commercial banks, and the Federal Reserve System, it realized a large "paper" profit from the revaluation of the dollar; which is to say, the Treasury could print additional paper money entitled "gold certificates" to a nominal value of nearly \$3 billion without acquiring additional gold and yet conform to the legal requirement that it hold a specified weight of gold (now less than before) for each dollar printed. Those gold certificates could not be legally held by private individuals, but they could be held by Federal Reserve Banks. Accordingly, to realize its "profits," the Treasury had to turn over gold certificates to the Federal Reserve System, receiving in return a deposit credit that it could convert into Federal Reserve notes or pay out by check. Stripped of its legal trappings, the economic effect was identical with a simple grant of authority to the Treasury to print and put in circulation nearly \$3 billion of fiat currency in addition to the \$3 billion in greenbacks already authorized by the Thomas Amendment to the Agricultural Adjustment Act.

Of the paper profit, \$2 billion was assigned to a stabilization fund set up under the control of the Secretary of the Treasury and authorized to deal in gold, foreign exchange, securities, and other credit instruments for the purpose of stabilizing the exchange value of the dollar. Of the balance of the paper profit, \$645 million was used for the redemption of national bank notes, which simply substituted one form of fiduciary currency for another; \$27 million was transferred to the Federal Reserve Banks for making industrial loans; \$2 million was charged off to losses in melting gold coin; and \$141 million remained in the General Fund cash balance.

Thus the interlude during which the United States was not on a gold standard was concluded. The type of gold standard on which it operated thereafter is the subject of the section that follows.

6. 1934-1948 -- the interwar, World War II, and postwar managed gold standard

The official price of gold remained fixed at \$35 an ounce from February 1, 1934, until March 31, 1972, when the official price was altered to \$38. In this sense, the date in 1934 marked the return to a gold standard. But the gold standard to which the United States returned was very different, both domestically and internationally, from the one it had left less than a year earlier. The mint bought all gold offered to it at the price of \$35 an ounce but sold only for the purpose of foreign payment. The holding of gold coin and bullion was forbidden to private individuals in the United States, except for use in industry and the arts and for numismatic holdings, and gold no longer circulated domestically. The Federal Reserve continued to have a gold reserve requirement, but the state of the reserve was not a direct influence on policy at any time from 1933 until the threatened depletion of the gold reserve in the period from 1948 to 1968, under the Bretton Woods arrangements. In 1945, when the System was approaching the then existing requirement (40 per cent for Federal Reserve notes and 35 per cent for Federal Reserve deposits), the law was changed to require a uniform 25 per cent.

Fixed buying and selling prices for gold were no longer the main reliance for maintaining rigid exchange rates with other currencies, even those of countries nominally on gold. Instead, a new central bank organ was created, the stabilization fund, with powers to engage in open market purchase and sale of foreign exchange and nonmonetary gold to influence exchange rates.

During the late 1930s, most of the so-called gold-bloc countries finally left gold, and nominally floating exchange rates with government speculation through stabilization funds became the rule. During the war, many countries fixed "official" exchange rates but sought to maintain them by extensive control over foreign exchange transactions, imitating the devices developed by Hjalmar Schacht for Germany in the 1930s, rather than by free purchase or sale at fixed prices of either gold or foreign exchange. Since then, an even wider variety of actual exchange rates came into use.

After 1934, the role of gold in the United States was not that of the base of the monetary system. Rather it became a commodity whose price was officially supported in the same way as the price of wheat, for example, was under various agricultural support programs. The major difference is that the support price for agricultural products was paid only to domestic producers, the gold-support price to foreign as well as domestic. In addition, the agricultural products accumulated were freely sold at the support prices to anyone, the gold only to certain foreign purchasers and not to any domestic ones. In consequence, the gold program set a floor under the world price of gold in terms of dollars.

The substitution in 1934 of a fixed price for gold, rather than a variable price as under the earlier purchase program in 1933 and early 1934, meant that the number of dollars spent on gold was no longer under the direct control of U.S. authorities. Having fixed the price, they were committed to buy all that was offered. But the effects of such purchases were the same as under the earlier program. For the United States, the purchases meant an increase in the dollar value of other exports relative to the dollar value of imports, thanks to a rise in prices of internationally traded goods relative to domestic goods through the combined effect of changes in exchange rates and in domestic

price levels of the various countries. For gold-producing countries, the purchases meant an increased price for one of their products, hence an expansion in the gold industry relative to other industries and a rise in income. For gold-standard countries, the price fixed for gold in the United States determined the rate of exchange between their currencies and dollars. They either had to adjust their internal price level to that new rate -- in the process presumably disposing of some of their reserves as measured in ounces of gold -- or to change their own fixed price of gold. For all gold-standard and gold-producing countries except the United States and for nongold-standard and nongold-producing countries, the gold purchases meant a reshuffling of international trade in response to a decreased U.S. demand for products other than gold, and an increased demand for such products by gold-producing countries; the program meant an increased supply of products from the United States and a decreased supply from gold-producing countries. Finally, international trade had to adjust to measures adopted by gold-standard countries to meet loss of their reserves.

The price fixed for gold initially overvalued the product and therefore stimulated a rapid increase in production and a rapid accumulation of government stocks. Production in the United States including its possessions rose from less than 2.6 million ounces in 1933 to 6 million in 1940; in the world from 25 million ounces in 1933 to 41 million in 1940. The rise in prices of other commodities and services from 1940 to 1948 lowered the relative price of gold and reduced U.S. gold output (1948) below its 1933 level, though world output still exceeded the level of that year.

There was an initial sharp jump in the U.S. gold stock from January to February 1934 that was accounted for primarily by the revaluation of gold, but part was produced by the substantial amount of gold imported, as foreigners took advantage of the higher buying price that became official on January 31.

Gold was almost immediately shipped to the United States. In the six weeks from February 1 to March 14, more than \$0.5 billion of gold (valued at the new price) was imported. Once the initial rush of gold imports ended, the gold stock continued to rise at a fairly steady rate to the end of 1937. Until France left gold in late 1936, roughly half of U.S. gold imports came from France. For the next year, France was a net importer of gold from the United States rather than a net exporter. During the last quarter of 1937, a large-scale withdrawal of foreign short-term balances followed rumors that further devaluation of the dollar was being considered as a possible counter-cyclical measure. Withdrawal of European short-term funds from the United States ceased in July 1938. These counter movements roughly offset the forces making for a continued flow of gold to this country, so the total gold stock remained fairly steady from autumn 1937 to autumn 1938. Munich then led to a further flight of capital from Europe and a sudden increase in the rate of gold inflow. The outbreak of war simply maintained the rate of the gold inflow. The intensification of Britain's war effort after the fall of France in early 1940 and her attempt to tap American supplies of war material, as she had in World War I, produced a further increase. Finally, the enactment of lend-lease in early 1941, which relieved Britain and her allies of the necessity of acquiring dollars to finance war purchases, brought an end to the rapid growth of the gold stock. In sum, the gold stock in the Treasury rose from 200 million ounces when the support price was fixed in early 1934 to 630 million ounces by the end of 1940, a rise that was 1 3/4 times as much as aggregate world output during the intervening period. The gold stock declined somewhat during the war, but an inflow in 1946-48, arising from the demand for U.S. goods of war-devastated and neutral countries, brought the stock to an all-time high in 1948 (exceeded only in 1949).

The rise in the dollar price of ^{currencies of} gold-bloc countries was at first much greater than that of currencies not linked to gold. From January 1933 to September 1934 the rise was 70 per cent for the currencies of France, Switzerland, Belgium, the Netherlands, and Italy, and less than 50 per cent for the pound sterling. The gold-standard currencies therefore appreciated not only relative to the dollar but also relative to other currencies. The differential appreciation measured the special impact of our gold price-support program on the position of the gold-standard countries. The fact that they lost gold meant that they bore, as it were, a larger part of the effect of the expansion of U.S. exports and contraction of U.S. imports other than gold than other countries did, and thereby cushioned the initial impact on those other countries.

Had nothing else intervened, the gold-standard countries would have had to reduce their internal price levels relative to those of other countries in order to stay on gold, that is, in order to render something like the new structure of exchange rates consistent with no pressure on the balance of payments. In fact, something else did intervene, but it intensified rather than eased the problem of the gold-standard countries. Gold purchases under the fixed price-support program coincided with a flight of capital to the United States from Europe largely induced by political changes: first, the rise to power of Hitler in Germany which led to a large-scale attempt to transfer capital out of Germany; then the increasing fears of war which led to a flight of capital from France, Britain, and other European countries.

If the United States had continued its floating exchange-rate policy of 1933 and had fixed no firm price at which it was willing to buy the world's gold, the capital flight would have produced an appreciation of the U.S. dollar relative to other currencies, which would have discouraged exports

from the U.S. and encouraged imports into the U.S. That outcome would have produced the unfavorable balance of trade required as the physical side of the capital import -- and incidentally, would have worked against one of the domestic objectives of New Deal policy, namely, to raise exports relative to imports as a means of stimulating employment. If, instead, the U.S. and other countries involved had all been on a gold standard of the nineteenth century variety, the attempt to transfer capital to the U.S. would have increased gold reserves in this country, even without a rise in the dollar price of gold, and decreased gold reserves abroad; it would have increased proportionately the money stock in the U.S. and thereby have promoted a rise in domestic prices and income; and it would have decreased the money stock abroad and thereby have promoted a fall in prices and income in foreign countries. These changes would have tended to produce precisely the same shift in relative prices and the same unfavorable balance of trade as the appreciation of the dollar under the hypothetical floating exchange rates would have done.

Since the flight of capital constituted an increased demand for dollars, its effects on exchange rates and on U.S. trade in commodities and services other than gold were in precisely the opposite direction to those of the gold price-support program and tended to offset them. There was simultaneously an increased offer of dollars for gold on the part of the U.S. government and an increased demand on the part of foreigners for dollars to hold. By trading assets held abroad for gold and transferring the gold to the U.S. Treasury, foreigners could acquire dollars and the Treasury could acquire gold without in any way affecting the rest of the U.S. balance of payments. To the extent that such offsetting occurred, the gold program did not affect U.S. trade currents and the relative prices of internationally traded goods

in ways referred to earlier. Since such changes in trade currents and relative prices tended to reduce the amount of gold offered for sale to the United States at its fixed price, the capital inflow meant that this country acquired a larger amount of gold at \$35 an ounce than it otherwise would have. Hence, while the capital inflow and the gold price-support program had opposite effects on U.S. exchange rates and on U.S. trade in commodities and services other than gold, both tended to raise its gold stock. For gold-standard countries that were themselves subject to a capital outflow -- that is, for all the important gold-bloc countries that had remained on gold after 1933 -- the capital inflow reinforced rather than offset the effect of the gold-price-support program. It required an additional reduction in internal price levels beyond that called for by the support program. Exports had to be still larger relative to imports if they were to finance the capital outflow without a continued outflow of gold.

The deflation that would have been required by the combined effect of the U.S. gold price-support program and the capital outflow was more than the gold-bloc countries were willing to undergo, as perhaps the effect of either alone might also have been. Accordingly, in the fall of 1936, France and Switzerland devalued their currencies in conjunction with a tripartite agreement between the United States, France, and Great Britain. The governments of Belgium and the Netherlands, which followed suit, and Switzerland also subscribed to the agreement.

All these countries set up exchange stabilization funds. The Tripartite Agreement of September 25, 1936, provided that stabilization fund holdings of foreign currencies would be used to avoid undesirable fluctuations in exchange rates. Arrangements for mutual currency support were undertaken, based on daily gold settlements at prearranged prices. Each day the authorities of the six countries would cable each other the prices in terms of their

own currencies at which they would sell and buy gold for the next twenty-four hours. Each party would then decide, without risk of exchange losses, the buying and selling rates for the currencies of the other participants. Foreign balances at the end of each day were convertible into gold at the guaranteed price. The agreement was a precursor of the swap arrangements that the industrialized countries perfected during the Bretton Woods period of international monetary arrangements. Under the agreement, the U.S. stabilization fund purchased foreign currencies in New York at rates the foreign funds determined and that day converted these currencies into gold earmarked to its account abroad or released to it from foreign earmarked holdings in the United States. Mainly, however, gold imports into the United States were brought in by foreign monetary authorities or private sellers of gold to the U.S. Treasury, not by the Fund.

In purchasing gold, as in purchasing agricultural or other commodities, the U.S. government can be said to have three sources of funds: tax receipts, borrowing, or money creation. The one difference is that the support program for other commodities (excepting silver) carried with it no authorization to create money, whereas the support program for gold did, thereby automatically providing the financial means for its continuance. Treasury deposits at Federal Reserve Banks could be increased through gold purchases by gold certificate credits equal to the amount of gold purchased times the official price of gold. Except for a minor handling charge (1/4 of 1 per cent), this was also in practice the amount the Treasury spent by drawing a check on its deposits in acquiring gold. Gold purchases were usually financed in this way; hence, increases in the gold stockpile produced no automatic budgetary pressure. The link between gold purchases and Treasury authorization to create high-powered money was the main remnant of the historical role of gold, and served to give gold some special monetary significance. The one important occasion

when a different method of finance was used was in 1937, when the Treasury "sterilized" gold by paying for gold with funds raised through security issues.

¹During the first nine months of 1937, the Treasury did not use the cash balances it could create on the basis of the gold it bought. Instead, it paid for the gold by borrowing from the public and the banks. What the Treasury took from the public and the banks by the sale of securities offset what it paid to the public and the banks by the purchase of gold. Accordingly, high-powered money did not reflect the growth of the gold stock.

The operation was economically identical with the sterilization actions of the Federal Reserve in the 1920s, when the System sold bonds on the open market to offset the increase in high-powered money that would otherwise have arisen from a gold inflow. The Treasury program became effective at about the same time the Federal Reserve was imposing two increases in reserve requirements on member banks (on March 1 and May 1, 1937; an earlier increase was imposed in August 1936). The sterilization program sharply reinforced the effect of the rise in reserve requirements in producing monetary restrictiveness: the rise in reserve requirements increased the demand for high-powered money; simultaneously the Treasury's action virtually brought to a halt an increase in high-powered money which had been proceeding with only minor interruptions since 1933.

A start toward desterilization was made in September 1937, when the Board of Governors of the Federal Reserve System requested the Treasury to release \$300 million from the inactive gold account. The Treasury released the amount requested by the Federal Reserve, but it continued to sterilize all further gold purchases, which amounted to \$174 million in that month. Hence inactive gold held by the Treasury fell only \$126 million in September 1937.

As of January 1, 1938, the Treasury limited the addition to the inactive gold account in any one quarter to the amount by which total gold purchases exceeded \$100 million, and on April 19, 1938, discontinued the inactive gold account, which then amounted to about \$1.2 billion. In the first half of 1938, accordingly, there was a more rapid increase in high-powered money than in the gold stock. The Treasury printed gold certificates corresponding to some of the inactive gold in the Treasury, deposited the certificates at the Reserve Banks, and drew on the balances it thus established to pay government expenses or to redeem debt. The operation was essentially an open market purchase of securities undertaken at Treasury initiative.

Initially, the shift of inactive gold from Treasury cash to Treasury deposits at the Federal Reserve Banks had no immediate monetary effect. Effective desterilization did not occur until more than a year after formal desterilization. Only after February 1939 did the sum of Treasury cash holdings and deposits at Reserve Banks decline toward the level that had prevailed before the sterilization program.

It is easier to describe the gold policy of the United States during the years 1934-1948 than it is to describe the resulting monetary standard of the United States. It was not a gold standard in the sense that the volume of gold or the maintenance of the nominal value of gold at a fixed price could be said to determine directly or even at several removes the volume of money. It was clearly a fiduciary rather than a commodity standard, but it is not possible to specify briefly who managed its quantity and on what principles. The Federal Reserve System, the Treasury, and still other agencies affected the quantity of money by their actions in accordance with a wide variety of objectives. In principle, the Federal Reserve System had

the power to make the quantity of money anything that it wished, within broad limits, but it seldom stated its objectives in these terms. It sometimes, as when it supported the prices of Government securities from 1942 to 1951, explicitly relinquished its control. And it clearly was not unaffected in its actions by gold flows. So long as the exchange rate between the dollar and other currencies was kept fixed, the behavior of relative stocks of money in various countries was necessarily close to what would be produced by gold standards yielding the same exchange rates, even though the mechanism might be quite different.

7. 1948-1968 -- the Bretton Woods dollar/gold standard system

The international monetary system that was designed at the Bretton Woods Conference in 1944 reflected professional views on the defects of the arrangements that had prevailed in the 1930s. Protectionist trade policies, controls on capital movements, exchange controls, and competitive currency depreciations of the pre-World War II period were the cautionary experiences to be avoided by the postwar world. Removal of controls on the free international movement of goods and capital, and the conduct of trade under a system of fixed exchange rates, with adjustment of parities limited to "fundamental" disequilibrium in the balance of payments, accordingly were the goals of the system created by the delegates to the Conference. Exchange rates were to be pegged within narrow margins to the dollar. Countries would buy or sell dollars in the foreign exchange market to keep their currencies from appreciating or depreciating more than one per cent from parity. The United States in turn would undertake to convert dollars into gold or the reverse at a fixed price of \$35 an ounce. The International Monetary Fund, to which each member subscribed 25 per cent of its quota in gold or 10 per cent of its net official reserves of gold and dollars, whichever was smaller, was established by the terms of the Bretton Woods charter. It was expected that

lending facilities of the Fund would supplement the members' gold and foreign exchange reserves to provide them liquidity when in balance of payments deficit on current account.

The establishment of par values for currencies was an important item on the Fund's agenda. Canada, France, the Netherlands, the United Kingdom and the United States declared their par values in December 1946, Germany and Japan in 1953, and Italy, not until 1960. Some of these parities were short-lived. An abortive attempt at convertibility of sterling in 1947 ended in September 1949, when the pound was devalued. The Netherlands thereupon devalued the guilder, and France, which has had separate rates for financial and commercial transactions, unified them, depreciating the franc vis-a-vis sterling.

In private gold markets until 1953, the price of gold was at a premium, but the IMF rule required monetary authorities to refrain from selling gold at premium prices. In March 1954, several months after the premium had been eliminated, reflecting balance of supply and demand, the London gold market reopened. For the rest of the decade, the price of gold in private markets remained at \$35 an ounce.

With the return of many European currencies to convertibility in 1958, the achievement of the Bretton Woods conception of international monetary normalcy seemed only a matter of time. The outflow of dollars in U.S. official aid, military spending, and private investment, and economic recovery in Europe and Japan had enabled foreigners to add to their holdings of dollars and gold. U.S. prices were stable until the middle of the decade of the '60s, and their rate of rise generally lower than in the rest of the world. Money supplies in the rest of the world (except in the U.K.) grew at a

faster rate than in the U.S. perhaps as a result of the U.S. contribution to the buildup of other countries' monetary reserves. The dollar's status as the reserve currency of the international economy seemed impregnable. Commercial banks and private firms could make foreign payments in their convertible currencies without the approval of central banks. Tariff and quota

restrictions on commodity trade among the industrialized countries were eased and foreign trade grew at a rapid rate during the period. International transfers of capital grew, with New York at the center of the flows, and the dollar as the vehicle currency in which the borrowers obtained capital and the investors lent their savings.

The successful operation of the system depended on foreign central banks intervening with their own currencies against the dollar to maintain par values, and the Federal Reserve abstaining from intervening to maintain the dollar exchange rate against other currencies. The U.S. balance of payments accordingly was determined by the exchange parities other countries established to achieve payments surpluses that would add to their dollar reserves.

A portent of the troubled future of the system was that 1960 was the first year in which U.S. gold reserves declined below the level of its total liquid liabilities to all foreign holders of assets denominated in dollars (Table 1).

Until March 1961, the U.S. intervened to maintain the price of gold by selling and buying dollars. Concern over the continuing conversion of dollars into gold led the Treasury to activate the Exchange Stabilization Fund and on March 13, 1961, the Federal Reserve Bank of New York as its agent was authorized to buy or sell foreign currencies in the forward exchange market. It sold forward D-marks to reduce the premium on that currency. On February 13, 1962, the Bank was also authorized to buy or sell foreign currencies on behalf of the Federal Open Market Committee in both spot and forward markets. For this purpose a stock of foreign currencies in addition to those acquired from the Stabilization Fund was needed. The Federal Reserve therefore negotiated a network of swap facilities with the central banks of other countries. The swap provided a specified amount of

Table I

Monetary
U.S. Gold Stock and Liquid Liabilities to Foreigners
(millions of dollars)

End of Year (1)	Total Monetary Gold Stock ^a (2)	Total Liquid Liabilities to All Foreigners ^c (3)
1954	21,793	12,454
1955	21,753	13,524
1956	22,058	15,291
1957	22,857	15,825
1958	20,582	16,845
1959	19,507	19,428
1960	17,804	{20,994 (21,027
1961	16,947	{22,853 (22,936
1962	16,057	24,068
1963	15,596	{26,361 (26,322
1964	15,471	{28,951 (29,002
1965	13,806 ^b	29,115
1966	13,235	{29,904 (29,779
1967	12,065	{33,271 (33,119
1968	10,892	{33,828 (33,614
1969	11,859	{41,735 (41,894
1970	11,072	{43,291 (43,242
1971	10,206	{64,266 (64,223
1972	10,487 ^d	78,680
1973	11,652 ^e	87,520 ^f
1974	11,652	119,164 ^f
1975	11,599	126,552 ^f
1976	11,598	151,356 ^f
1977	11,719	192,321 ^g
1978	11,671	
1979	11,172	
1980	11,160	

Notes to Table 1

Source: A. Banking and Monetary Statistics, 1941-1970. Board of Governors of the Federal Reserve System, Washington, D.C., 1976

B. Federal Reserve Bulletin, March 1975, A61, A63; March 1978, A55, A57; June 1978, A56; May 1981, A53, A56.

Col. (2): Source A, p. 899; Source B, A61, A55, A56.

Col. (3): Source A, pp. 932-933; Source B, A63, A57, A56.

^a The stock includes gold sold to the U.S. by the IMF with the right of repurchase, and gold deposited by the IMF to mitigate the impact on the U.S. of foreign purchases for the purpose of making gold subscriptions to the IMF under quota increases.

^b The figure excludes \$259 million gold subscription to the IMF in June 1965 for a U.S. quota increase that became effective Feb. 23, 1966.

^c The total includes small amounts due to the IMF arising from gold transactions, amounts due to official institutions, commercial banks abroad, to other foreigners, and to nonmonetary and regional organizations. Nonliquid liabilities to official institutions included in the source beginning 1962 through 1973 have been deducted. Years for which two entries are shown show differences because of changes in reporting coverage. Figures on the first line are comparable with figures for preceding dates; figures on the second lines are comparable with those for the following dates.

^d Change in par value of dollar on May 8, 1972, increased the value of the total gold stock by \$822 million.

Notes to Table 1 (concluded)

^eChange in par value of dollar on Oct. 18, 1973, increased the value of the gold stock by \$1,165 million.

^fNonliquid liabilities which are not distinguished in the source may be included. Preliminary figures for 1974 showed nonliquid liabilities equal to \$6,124 million. In 1973, the total for the item was \$4,871 million.

^gThe table giving U.S. liabilities to all foreigners was discontinued after the June 1978 issue of Source B. A new table, Selected Liabilities to Foreign Official Institutions, replaced it. The entries for 1975-1980 are as follows.

1975	82,572
1976	95,634
1977	131,097
1978	162,589
1979	149,481
1980	164,312

Source B: Dec. 1978, A58; May 1981, A56

foreign currency in exchange for an equivalent dollar credit for the foreign central bank, with each party protected against loss due to a change in par values. Invested balances of both parties earned the same rate of interest, foreign balances in special U.S. Treasury certificates, Federal Reserve balances in interest-earning deposits abroad. Balances were available for payments to other central banks or for foreign exchange market transactions. The swap was a credit line, for 3- or 6-month periods, renewable at maturity. By drawing on the credit, gross reserves of both parties were increased. The U.S. normally used the proceeds of a swap to absorb dollar holdings, in effect, substituting forward dollars for spot dollars held by the partner, to reduce the threat of their conversion into gold.

Repayment of short-term swap credits meant a corresponding decline in gross reserves. For the U.S. this could entail a loss of gold. To deter this eventually, the U.S. began issuing nonmarketable bonds, with maturities of 15 months to two years, denominated in the holder's currency, to fund outstanding swap debt. The bonds were, however, convertible into Treasury bills on demand.

A further indication of U.S. concern about gold was the prohibition after mid-1961 on holding of gold outside the U.S. by U.S. firms and households, and on March 3, 1965, the abolition of gold reserve requirements against Federal Reserve deposits.

A focus of pressure on the U.S. dollar was the London gold market. In March 1960, the price rose above \$35 an ounce, as European central banks and private investors bought gold for dollars. The Bank of England sold gold to stabilize the price, but the U.S. Treasury initially was not willing to restore the Bank's holdings. Hence, when a rise in the price of gold occurred in October, the Bank did not intervene. On October 27, with the price reaching \$40 an ounce, the Treasury agreed to sell gold to the Bank,

reserving for the Bank the decision on intervention in the market. European central banks soon after agreed to refrain from buying gold in the London market for monetary purposes whenever the price rose above \$35.20, the U.S. price plus shipping costs. When the price fell below that level in 1961, the central banks returned to the market. However, in October 1961, when the price again was reacting to heightened demand, an agreement to create a "gold pool" was reached, on U.S. initiative. The U.S. contributed \$135 million to the pool and seven European governments an equal amount to be used to replenish gold sold by the Bank of England as manager of the market. The members of the pool subsequently agreed not to buy gold individually on the market, but to give the Bank of England the right to buy on their joint account when gold supply exceeded demand, the amount purchased to be distributed in proportion to each country's contribution to the pool. The pool functioned until the end of 1967, when a surge of buying led to the suspension of the arrangement in March 1968.

A key development for the international monetary system that was not perceived as such at the time was the acceleration of the U.S. monetary growth rate and the subsequent acceleration of the U.S. inflation rate in the final years of this subperiod. What was perceived was the cumulative growth of deficits in the U.S. balance of payments. Assets denominated in dollars grew in excess of the demand for them by the rest of the world. Their conversion into gold, by shrinking U.S. gold reserves, threatened one of the basic underpinnings of the Bretton Woods structure, namely, convertibility of dollars into gold.

The Bretton Woods system might have been able to survive an end of gold convertibility. It could not survive inflationary monetary policy in the center country that characterized the decade from the mid-'60s on.

Crisis management by the IMF and the central banks of the leading industrialized countries became the hallmark of the international monetary system during the heyday of Bretton Woods. The chief currency under pressure, apart from the dollar, was sterling. Persistent or recurring U.K. balance of payments deficits impaired the credibility of sterling's external value, already insecure by reason of the size of sterling balances held worldwide relative to U.K. gold and foreign exchange reserves. Private agents displayed lack of confidence in the dollar and sterling by shifting to currencies whose external values were regarded as stable or likely to appreciate (during this period, the D-mark and guilder). Repeated rescue operations to support the exchange value of sterling were overwhelmed in November 1967. Sterling, however, was a sideshow. The main act was the dollar's performance.

The gold market was the market in which participants expressed lack of confidence in the dollar-based international monetary system. After the devaluation of sterling in November 1967, the vulnerability of the dollar took center stage. In the winter of 1967-68, a surge of demand for gold threatened both the London Gold Pool and the \$10 billion statutory backing for Federal Reserve notes. On March 12, 1968, the U.S. gold reserve requirement was abolished. Ostensibly, the gold stock was then available for conversion of dollars held by foreign central banks. On March 17, however, the London gold market was closed to avoid further U.S. gold losses. The contributors to the gold pool announced that they would no longer supply gold to the London or any other gold market or buy gold from the market. Official transactions between central banks were to be conducted at the unchanged official price of \$35 an ounce, but the gold price for private transactions was to be determined in the market. Central banks were still

free de jure to buy U.S. Treasury gold for dollars but in fact refrained from doing so. Germany had explicitly forsworn converting its dollar holdings into gold in May 1967.

One measure the U.S. authorities might have taken was a rise in the dollar price of gold, thus increasing the value of the stock and the flow of reserve assets. If other countries did not follow suit by adopting a proportional increase in the price of gold in their currencies, the U.S. in this way might have obtained a devaluation of the dollar that the Bretton Woods system otherwise ruled out. Had the price of gold risen, the gold demands of other countries might have been satisfied without the rundown in U.S. reserve assets. Some countries might also have revalued because of the inflationary consequences of their payments surplus, given the gold-based increase in their asset holdings.

The U.S., however, resolutely opposed a change in the monetary price of gold. Given the fixed price of gold when national price levels were rising, gold became an undervalued asset with a resulting gold shortage.

The measures adopted to avoid exchange rate changes were intended to limit international transmission of price change. Surplus countries tried to avoid price increases; deficit countries, price declines, both as external consequences of their balance of payments positions. Intermittently, depending on cyclical conditions, countries in both categories took steps to right payments imbalance.

Since palliatives to improve the balance of payments proved ineffective, deficits had to be financed either by drawing down reserves or seeking external credit or borrowing facilities, while surpluses obviously increased reserve accumulations. During the heyday of the Bretton Woods system, despite the growth of dollar assets, the adequacy of international liquidity,

in the sense of the quantity of international monetary reserves, was widely debated. Discussions during this period growing out of concern for the supply of reserves led to the creation of SDR's by the IMF, but that development belongs in the account of the breakdown of the system. Until 1968, international reserves were limited to gold, convertible foreign exchange, and reserve positions in the IMF.

Contrary to the design of Bretton Woods, financing of payments imbalances for the most part was arranged through credits governments extended on a bilateral basis and through international borrowing and lending activities of commercial banks. Thus to restore depleted reserves of countries with persistent deficits, facilities for borrowing were created in addition to drawings from the IMF.

Official dollar reserves of the surplus countries were augmented at times by actions those countries took in the Eurodollar market. Dollars acquired by their central banks and deposited in the Eurodollar market either directly or through the Bank for International Settlements would usually be relent to private borrowers who could resell the dollars to the central banks.

In sum, world reserves grew rapidly during the period.

8. 1968-1973 -- the breakdown of the Bretton Woods system

The devaluation of sterling in November 1967 was not regarded as the prelude to changes in the par values of other currencies, the devaluation of the dollar in terms of gold, the realignment of exchange rate relationships among the major currencies, and the substitution of a short-lived regime of central rates for the par value system -- all of which took place between November 1967 and December 1971. Instead, it was hoped that balance in the U.S. and U.K. external payments was finally on the point of achievement, and that the creation of a special drawing rights facility in the IMF would replace reserve assets that dollar and sterling deficits had provided.

The hope was belied. The pattern of deficits and surpluses persisted and worsened in 1970 and 1971. The U.S. current account surplus dwindled and the U.S. capital account deficit grew dramatically, producing current account surpluses and capital inflows in other countries. The activation of SDRs in 1970-72 provided additions to already massive acquisitions of dollar reserve assets.

As in the heyday of the Bretton Woods system, disbelief of market participants in the pegged external values of currencies precipitated turbulence in the foreign exchange market.

The persistent outflow of funds from the U.S. overwhelmed foreign exchange markets in the first few days of May, 1971. On May 5, seven European countries closed their foreign exchange markets, and five others on several continents withdrew their support for the dollar and suspended dealings in D-marks, guilders, and Swiss francs. On May 9, both Germany and the Netherlands announced that their currencies would float, since they could not maintain exchange rates within the established margins.

In March 1971, before the panic of the foreign exchange market, there was a request from several European countries for conversion of officially held dollars into gold to enable them to pay for an increase in their IMF quotas. The payout reduced the U.S. gold stock to the lowest level since 1936. The dollar outflow meanwhile accelerated, leading, as noted, to the floating of European currencies. The imbalance between U.S. gold reserves and outstanding dollar liabilities occasioned the changes the U.S. introduced on August 15, 1971, to achieve a dollar devaluation. Chief among them (besides a price and wage freeze, tax increases and federal government spending cuts) was a 10 per cent import surcharge on 50 per cent of total U.S. imports. The convertibility of the dollar into gold

was formally suspended, as was also the swap network through which dollars could be exchanged with central banks for other currencies. The effect was to oblige other countries to hold dollars or to trade them for a price determined in the market and so revaluing their currencies. Foreign exchange markets abroad, except in Japan, shut down. The Japanese initial attempt to maintain

the pegged rate of the yen compelled them to purchase \$4 billion in the two weeks after August 15. The yen was then freed to float upward; other currencies floated when exchange markets were reopened on August 23. France introduced a dual exchange market, with trade and government exchange dealings based on the par value, financial exchange dealings at a floating rate. Restoration of a repegged system of exchange rates, however, remained the goal of the U.S. and its partners.

After much negotiation, a readjustment of currency parities was arranged at a meeting at the Smithsonian Institution in Washington on December 17-18, 1971. In return the U.S. agreed to withdraw the import surcharge. Currencies were revalued by percentages ranging from 7 1/2 (Italy) to 16.9 per cent (Japan), with the proviso that 2 1/4 per cent margins of fluctuations (replacing the former 1 per cent margin) above and below the new so-called "central" exchange rates were permissible. The Canadian dollar continued to float. The Smithsonian agreement also specified that the official dollar price of gold would henceforth be \$38, a concession by the U.S. for appearance sake only, since the dollar remained inconvertible. The new price of gold implied a depreciation of the gold-value of the dollar rather than an appreciation of the dollar value of other currencies.

The central rates established at the Smithsonian meeting crumbled during the nine months following the floating of sterling ^{in June 1972}. Once again, the disbelief of market participants in those rates was revealed in the gold and foreign exchange markets. The London free market price of gold rose with few reversals. Money growth and inflation rates continued to rise in the U.S. and both the balance of trade and the U.S. balance of payments deficit soared, with a corresponding surge in dollar holdings of the industrialized European countries and Japan. Capital controls were imposed in 1972 by Netherlands ^{the} and Japan before sterling was floated and Germany followed suit afterwards.

On February 10, 1973, Japan closed its foreign exchange market and suspended support of the dollar. New central values were set in a hurried round of negotiations, although the lira, yen, Canadian dollar, the U.K. and Irish pounds, and the Swiss franc all floated. Again, the official price of gold was raised (this time to \$42.22), leaving unchanged the gold value of other currencies. The new central rates did not staunch the flow of dollars abroad, and a further crisis erupted in March 1973. This time the major industrial countries discontinued pegging their exchange rates to the dollar. The EEC countries in the snake, which had been activated in April 1972, plus Sweden and Norway agreed to a joint float, with Germany revaluing by 3 per cent (in terms of SDRs) in relation to the other members. Canada, Japan and Switzerland floated individually, as did a handful of other countries. Though a large group of nonindustrialized countries pegged to the dollar, the dollar currency area worldwide contracted; smaller groups of countries pegged to the French franc or to the pound.

9. 1973-1981 -- the United States on an inconvertible paper standard

When pegged rates were abandoned in March 1973, it was initially assumed that floating was a temporary expedient to be succeeded by a reformed par value system. The U.S. took the lead in opposing the return to such a system. The dispersion of inflation rates among the industrialized countries and the higher variability of rates of inflation since the late 1960s enforced more frequent changes of exchange rates. Under the earlier system, changes in par values were delayed until foreign exchange market crises were provoked. The lesson since the shift in March 1973 was that floating provided more flexibility. The U.S. view prevailed. In place of the par value system ordained in the Articles of the Bretton Woods charter, an amendment in April 1976 gave member banks the option to float for an indefinite period or to peg exchange rates, at their discretion. The IMF accepted a fait accompli

although, to placate opponents of the float, another provision stipulated that at a future unspecified date reestablishment of a system of fixed but adjustable rates was possible with an 85 per cent affirmative vote by the members, thus giving the U.S. an effective veto.

It was widely believed that the stock of reserve assets would contract in a world of floating exchange rates compared to a world of pegged rates. In fact, official holdings of reserve assets have increased in every year since the float. From 1950 to 1969, on average, world reserves including gold rose by less than 3 per cent per year, the foreign exchange component by 5 per cent per year. From the end of 1969 to the end of 1972, the average annual rate of increase of foreign currency reserves was 43 per cent. Since 1973, the average annual rate of increase has been 15 per cent. The main source of growth of foreign currency reserves since 1973, as in earlier years, has been in the form of dollars. The demand for reserves has increased even under floating rates because the system is substantially managed.

A significant change in the distribution of foreign exchange reserves has occurred since October 1973 as a result of the rise in the price of oil. Total foreign exchange reserves of industrial oil-importing countries have remained roughly stable, but the major oil-exporting countries, which in 1970 held only about 5 per cent of total world foreign exchange reserves, by the end of the decade held about one-quarter of the total, the value of which had tripled since 1970.

The dollar has continued to serve as the main reserve currency, accounting for about 80 per cent of the world's official foreign exchange reserves. As under pegged rates, the U.S. continues to pay for its imports in dollars, which foreigners add to their reserve accumulations, and use to settle their deficits with other countries. The dollar also remains the common official intervention currency in foreign exchange markets, and serves as a common

vehicle currency in the interbank market for foreign exchange. In effect, the world has adopted an inconvertible dollar standard.

One change in the international reserve profile was the creation on March 13, 1979, of the European Monetary System -- replacing the "snake", the European joint float -- by nine European countries (Belgium, Denmark, France, Germany, Ireland, Italy, Luxemburg, and the Netherlands; the U.K. is a member but does not participate in intervention arrangements). The center of the system is the European Currency Unit (a basket of all nine currencies), issued by the European Monetary Cooperation Fund in an amount equal to a deposit of 20 per cent of gold and dollar reserves of participating countries, to be used for settlement of intervention debts. ECUs, now included in foreign exchange holdings of the participating countries, do not increase world monetary reserves. The ECUs issued value gold on the basis of either the average market price of the six preceding months or the average market price on the day before issue, whichever was lower.

With gold valued at market price, world gold reserves at the end of 1979 were larger than foreign exchange reserves. The U.S., however, values its own gold assets at the official price of \$42.22 per ounce, despite the IMF's abolition of that price.

After the float, the U.S. took the position that gold should be demonetized. An opposing view was promoted principally by France. Developments reflect the extent to which one or the other dominated international decisions. At issue was the use of gold in official transactions at the free market price, and the substitution of gold for the dollar in inter-central bank settlements at a fixed but higher official price.

The ban on official transactions in the gold market that had been adopted in March 1968 was terminated in November 1973, but the official price of \$42.22 posted in February 1973 was so far below the private market price that

central banks were unwilling to buy and sell gold among themselves at the official price. The central banks were equally reluctant to sell gold on the private market in view of the possible depressive effect of sales on the market price or in anticipation of the opportunity to sell in the future at a higher price. In December 1973, the IMF terminated a decision made four years earlier to refrain from purchasing South African gold for the Fund.

In June 1974, countries in the Group of Ten agreed that an inter-central bank loan could be collateralized by gold at a price other than the official gold price, and in September, Italy obtained a loan from Germany on the pledge of Italian gold valued at a mutually agreed price. In December, the U.S. and France agreed that central banks were at liberty in valuing gold holdings for balance sheet purposes to use the market price, which the Bank of France proceeded to do.

Early in 1975, the countries in the Group of Ten and Switzerland agreed for a two-year period not to increase the sum of their and the IMF's gold holdings and to contribute no support to the price of gold in the free market. In August 1975 agreement was reached by an IMF committee that

the official price of gold would be abolished

members would not be obliged to use gold in transactions with the Fund

a part of the Fund's gold holdings would be sold at auction for the benefit of developing countries and another part would be returned to member countries in proportion to their quotas.

The first public auction of part of the Fund's gold holdings was held in June 1976. A four-year sales program was scheduled. In the first two years, 16 auctions were held approximately every six weeks, with aggregate sales of 12.5 million ounces. The balance of 12.5 million ounces was sold mainly in

24 auction lots through May 1980, and a small amount in noncompetitive sales. Restitution of 25 million ounces to member countries over a four-year period was completed in December 1979/January 1980.

The U.S. repealed the prohibition against gold holding by U.S. residents as of January 1, 1975, and empowered the Treasury to offset any increase in market price as a result of this increment to private demand by offering gold at auction. The first auctions were held in January and June 1975, when the Treasury disposed of 1.3 million ounces. No auctions were held in 1976 and 1977. They were resumed in 1978 and 1979, when the Treasury sold 4.0 and 11.8 million ounces, respectively, motivated as much by the desire to reduce the U.S. balance of payments deficit on current account as by the belief "that neither gold nor any other commodity provides a suitable base for monetary arrangements."

The gold sales constituted open market operations approximating \$0.8 billion in 1978 and \$3.6 billion in 1979. Gold sales by the Treasury reduced the public's deposits and so bank reserves. The sales thus initially provided a partial offset to ^{Federal Reserve} open market purchases of government securities that increased the public's deposits and bank reserves. It was a partial offset only because the System's portfolio of government securities showed a net increase of \$7.7 billion in 1978 and of \$6.9 billion in 1979. It was an offset initially only depending on the Treasury's use of the proceeds of the gold sales. To the extent that the Treasury used the proceeds to retire gold certificate credits and thereby reduced its deposits at the Federal Reserve, the monetary effects of the gold sales were contractionary. However, to the extent that it disbursed the remainder of the funds it acquired, the Treasury's action restored the public's deposits and bank reserves, so the contractionary effect on the money supply of the gold sales was limited.

Since 1979, the Treasury has sold no gold bullion. In July 1980, however, it began the sale of half-ounce and one-ounce gold medallions, in accordance with P.L. 95-630, November 10, 1979. The legislation provided that not less than 1 million troy ounces of fine gold be struck into medallions and sold to the public over a five-year period at a price covering all costs. In 1981, U.S. Government gold inventories amounted to 264.2 million ounces. The Reagan Administration has announced that its position on the proper role of gold in the international monetary system will not be formulated until the Congressionally mandated gold commission issues its report.

Direct official intervention to maintain the open market price of currencies within narrow limits has not lessened under floating rates compared with the pegged parity system. Intervention in some countries is assigned to nationalized industries that borrow foreign currency in order to buy their own currency on the foreign exchange market, in Italy and the U.K., with government provision of insurance against foreign exchange loss, in France with no such provision. In Japan and sometimes in France, dollar deposits held by the government at commercial banks are used for intervention.

Italian and French commercial banks intervene at the government's behest. Central bank intervention may thus be conducted by a variety of institutions at the direction of the monetary authorities.

The pattern of intervention since the float by the U.S. and its trading partners is to buy dollars both when the dollar depreciates and when foreign currencies appreciate. Countries with weak currencies sell dollars. When the supply of dollars increases in foreign exchange markets, managed floaters may buy up some of the additional dollars or may permit the price of dollars to fall in terms of their own currencies. Buying up dollars has negative consequences for domestic monetary control; permitting the price of dollars to rise has negative consequences for oil-importing countries.

There was apparently little intervention during the four months following the float in February 1973. The progressive decline in the weighted exchange rate of the dollar between February and July 1973 vis-a-vis a group of major currencies led to a decision by the governors of the central banks of the Group of Ten to support the dollar. In July 1973, the Federal Reserve Bank of New York began to intervene in the New York spot exchange market to maintain "orderly market conditions." Intervention was effected with the Federal Reserve's own small holdings of foreign currency or by activating the much larger total of foreign currency loans through swap agreements.

Concerted exchange intervention was agreed to by the Federal Reserve, the Bundesbank, and the Swiss National Bank in May 1974, after several months of dollar depreciation. The dollar strengthened until September when renewed weakness developed through March 1975. The explanation given by the Board of Governors was:

Contributing to this decline in the dollar's exchange value was the asymmetry in intervention policies between countries with weaker currencies and those with strengthening currencies. Intervention sales of dollars by countries supporting weaker currencies exceeded purchases of dollars by countries resisting the appreciation of their currencies. The net effect of these operations was to add to the market supply of dollars, depressing the dollar's average exchange rate.

Explicit approval of management of floating exchange rates was expressed by the IMF in six guidelines it issued in June 1974. Acceptance of intervention as desirable policy was reiterated in a November 1975 meeting that preceded the revision of the IMF's Articles of Agreement in 1976.

Since the dollar showed little weakness in 1976, the Federal Reserve intervened to sell dollars on behalf of other currencies. In January the Italian lira came under pressure. The decline in its exchange value weakened the French franc within the European currency "snake," leading to substantial French intervention. Massive intervention to support sterling which declined from \$2.00 in March to \$1.77 in mid-September was provided by a \$5.3 billion stand-by credit arranged by the Group of Ten countries, Switzerland, and The Bank for International Settlements. Sterling's further decline later in the year led to an IMF drawing, further borrowing, and a facility to reduce official sterling balances. Interventions were also engaged in to moderate appreciations of the D-mark, the Swiss franc, and the yen.

Renewed weakness of the dollar in early 1977 was masked by large intervention purchases of dollars by the Bank of England and the Bank of Italy undertaken to limit the appreciation of their currencies and to rebuild their reserve positions. The Federal Reserve intervened only occasionally during the first three quarters. When the Bank of England ended its large purchases of dollars, the dollar dropped sharply. The Federal Reserve increased the scale of intervention, joined by the U.S. Treasury, which negotiated a new swap facility between the Exchange Stabilization Fund and the Bundesbank.

The decline in the weighted average exchange value of the dollar accelerated in 1978 through the end of October. An anti-inflation program announced on October 24 (contractionary fiscal and monetary policy, voluntary wage and price standards, and a reduction in the cost of regulatory actions) had no effect on the exchange market. On November 1, the Administration and the Federal Reserve took further action. A \$30 billion intervention package was arranged with Germany, Japan, and Switzerland. The Federal Reserve raised the discount rate from 8 1/2 to 9 1/2 per cent, and imposed a 2 per cent supplementary reserve requirement on large time deposits. During the last two months of 1978, U.S. support operations for the dollar totaled \$6.7 billion, including sales of Treasury securities denominated in foreign currencies, accompanied by significant purchases of dollars by Germany, Japan, and Switzerland. By June 1979, the dollar had risen from its 1978 trade-weighted low by about 10 per cent. From that month on, the dollar weakened. The Federal Reserve raised the discount rate to 11 per cent in September, and the U.S. sold the equivalent of \$4.2 billion in D-marks between August and early September.

On October 6, 1979, the Federal Reserve announced a wide-ranging set of measures to tighten monetary control (a shift in operating procedures from control of the Federal Funds rate to control of bank reserves; an increase in the discount rate to 12 per cent; a marginal reserve requirement on banks' managed liabilities), and the dollar began to appreciate. After April 1980, however, the dollar began to decline, a movement that was reversed in September. From February 1980 on, the U.S. intervened frequently, operating on both sides of the market. When the dollar was in demand, it acquired foreign currencies in the market and from correspondents to repay earlier debt and to build up balances. The Federal Reserve was a buyer from February to March. From late March to early April and beyond, it sold D-marks, Swiss

francs, and French francs. By the end of July, the U.S. was again accumulating currencies. Both the Treasury and the Federal Reserve Trading Desk purchased D-marks and lesser amounts of Swiss francs and French francs on days when the dollar was strong, selling on days when the dollar weakened. By the end of 1980, the U.S. was in currency markets on a day-to-day basis.

The Reagan Administration has announced its intention to reduce the scale of intervention, to discontinue the policy of building up currency reserves, and to cut back its short-term swap arrangements with foreign countries. The reason for the shift in policy is the administration's view that intervention is both costly and ineffectual, and that the way to restore exchange rate stability is by the creation of more stable domestic economic conditions. European central banks do not share the Reagan Administration's views and continue to intervene to affect the exchange value of their currencies. This raises a question whether the degree of control U.S. authorities can exercise over the effective exchange rate for the dollar under a floating rate system is any greater than under a pegged exchange rate system.

The Bretton Woods System broke down essentially because non-reserve currency countries were unwilling as a group to adopt the policy of inflationary monetary growth the reserve-currency country was pursuing. To achieve independent monetary policy, the only workable exchange rate system was floating. Flexible exchange rates permit a country to choose its desired long-run trend rate of monetary growth and of inflation, independent of other countries' choices.

Even when autonomy exists, monetary policy may perform badly. It is in this context that the movement in a number of countries during the 1970s toward the improvement of monetary control must be viewed.

Central banks have typically used short-term interest rates as the instrument to control monetary growth. Under non-inflationary conditions, this conduct produced a pro-cyclical movement in monetary growth. Under the gathering inflationary conditions since the mid-1960s, the inflation premium that became imbedded in interest rates made the instrument unreliable as an indicator of restriction or ease. Reliance on it contributed to a secular rise in the rate of monetary growth. Central banks in a number of countries, some more willingly than others, in the 1970s adopted targets for monetary growth without necessarily abandoning their desire to hold down interest rates or exchange rates, so that successful targeting has not invariably been the result. If it was hoped that public announcement of targets for monetary growth would itself reduce expectations of inflation, the failure time after time to achieve the targets has diluted any possible effect on the formation of expectations.

The period since October 6, 1979, when the Federal Reserve announced a new procedure to improve control of monetary aggregates, is probably too brief to pronounce judgment on the likelihood that the System will achieve its objectives of steady deceleration in monetary growth. The inconvertible paper monetary standard operated at the discretion of monetary authorities is on trial.

What is the current role of gold? IMF members no longer define the exchange value of their currency in terms of gold and trade in and account for gold at any price consistent with their domestic laws. Gold is no longer the numeraire of the international monetary system. The introduction of SDRs (valued in terms of a basket of national currencies, as of July 1974), rather than in terms of gold, was intended to replace both the dollar and gold in the international monetary system.

The market price of gold has increased more rapidly since the float than the prices of most other durable assets. The future role of gold in the international monetary system as a reserve asset and as a determinant of the world's price level may depend on the performance of the dollar. If the performance of the dollar improves, gold may be dethroned even if its use as a reserve asset continues. Failure of the dollar to perform in

a stable fashion in the future leaves open the possibility of a restoration of a significant role for gold.

10. Summary

The United States adopted a de facto gold standard in 1834. Thereafter, it adhered to some form of a gold standard with only two extended interruptions, once for 17 years in the 19th century, and again in this century, for 13 years, if one dates the interruption from 1968, when the two-tier London gold market was created; for 10 years, if one dates it from 1971, when convertibility of the dollar, even for official transactions, was formally suspended; for 8 years, if one dates it from 1973, when floating exchange rates were formally adopted by the United States and the Western industrial countries. The political objective of returning to the gold standard was achieved in the 19th century case, despite opposition from silver and paper money advocates. Whether that political objective is currently achievable cannot be determined from a retrospective view.

In addition to the two extended interruptions in U.S. adherence to a gold standard, temporary suspension of a few weeks to a year's duration occurred in 1837, 1839, 1857, 1893, 1907, 1917-19, and 1933. In all cases but the latter two, the years in question climaxed periods of economic expansion in the United States, fostered by external as well as internal factors. The pace of the expansions raised U.S. prices and incomes above those prevailing in the rest of the gold standard world. To bring the U.S. price and income structure into alignment with that of its trading partners enforced reductions in the U.S. money stock, usually resulting from a decline in U.S. gold reserves and in capital imports from abroad. Prices, output, and employment subsequently declined, accompanied by bankruptcies of firms and bank failures. Suspension of specie payments in the years under review

was a means of mitigating the costs of deflationary adjustment that maintaining par values of the exchange rate imposed. The devaluation implicit in suspension gave the economy a breathing spell. With recovery, the former par value of the exchange rate was restored.

No special comment is needed on the World War I restriction of interconvertibility between paper money and gold and the free international movement of gold. The situation in 1933, however, does require comment. That year was in no respect similar to the earlier examples of temporary devaluations. 1933 was a year of a business cycle trough after four years of deflation. The deliberate reduction in the gold content of the dollar was arranged to achieve a price rise of nongold commodities, and the devaluation was never reversed. Moreover, the fixed exchange rate gold standard to which the United States returned in 1934 was the same in name only to the pre-1933 gold standard.

Before 1914, gold flows in and out of the United States determined the expansion or contraction of the economy. Between 1919 and 1933, large outflows of gold occasioned contractionary actions by the monetary authorities; small outflows and inflows of gold, whether large or small, were sterilized. After 1934, both inflows and outflows were not permitted to determine monetary growth and the performance of the economy. When the gold reserve ratios applicable to Federal Reserve deposits and notes were close to the minimum legal requirement, the minimum was lowered and eventually abolished. Gold became a symbol rather than an effective constraint on the operation of the monetary authorities.

Figures 1-2 summarize the evidence on the performance of the economy; Figures 3-4, evidence on the purchasing power of gold, whether the gold standard was suspended or in effect.

Trend movements in prices are the most striking feature of Figure 1. From 1834 to 1861, a mild downward trend prevailed, with pronounced cyclical upswings and downswings around the trend. The greenback period from 1862 to 1878 shows the sharp wartime price rise to 1865 followed by a decline of equal magnitude spread over the years to the close of the period. That decline persisted during the gold standard period to 1896, reflecting the disparity between the rate of growth of the monetary gold stock and the enlarged world demand. The reversal of the downward trend from 1896 to 1914 reflects the dramatic increase in world gold output during that period. World War I, like the Civil War period, shows a steep price increase to 1920, followed by the steep price decline from 1920 to 1921, rough stability during the 1920s, and then the great deflation of 1929-33 that restored the wholesale price series to its pre-World War I level, the implicit price deflator to a somewhat higher point than the pre-World War I level. The contraction of 1937-38 is apparent in the post-1933 upswing which continues into and beyond World War II. The wholesale price series shows rough stability in the early 1960s, whereas the implicit price deflator continues an upward movement. Both series accelerate after the mid-1960s.

Figure 2 plots the deviations of real per capita output from its long-run trend. The trend has been strongly positive from 1870 to 1980, as might be expected. There was substantial variance about the trend before 1914 but far smaller in magnitude than from 1914-47, reflecting the sharp swings in the three interwar deep depressions, 1919-21, 1929-33, 1937-38, as well as the wartime movements. However, the pre-World War I variance was marginally greater than the variance of the deviations from trend post-1948. A comparison of the standard deviations of year-to-year percentage change in real per capita income also shows little difference

between the pre-World War I gold standard experience and post-World War II experience: 5.8 per cent vs. 5.5 per cent. Unemployment was on the average lower in the pre-1914 period than in the post-World War I period; 6.8 per cent vs. 7.5 per cent. But again, excluding the interwar years, unemployment 1946-80 averaged 4.8 per cent, reflecting the government's commitment to maintaining employment.

Figure 3 compares the purchasing power of gold, derived in index form from the quotient of the price of gold divided by the wholesale price index, compared with the U.S. monetary gold stock. Under the gold standard, a rise in the purchasing power of gold ultimately increased the growth of the U.S. monetary gold stock by raising the rate of world gold output, and inducing a shift from nonmonetary to monetary use of gold. Movements in the purchasing power of gold thus preceded long-term movements in the monetary gold stock. This relationship underlay the reversion of the price level towards stability under the gold standard. Price increases or decreases tended to be reversed after a run of years. Persistent inflation of post-World War II experience, without a force to reverse the trend, could not have occurred under a fully functioning gold standard. The absence of this positive association after World War II between the purchasing power of gold and long-term movements in the monetary gold stock reflects the loosening of the link between the money supply and the gold stock.

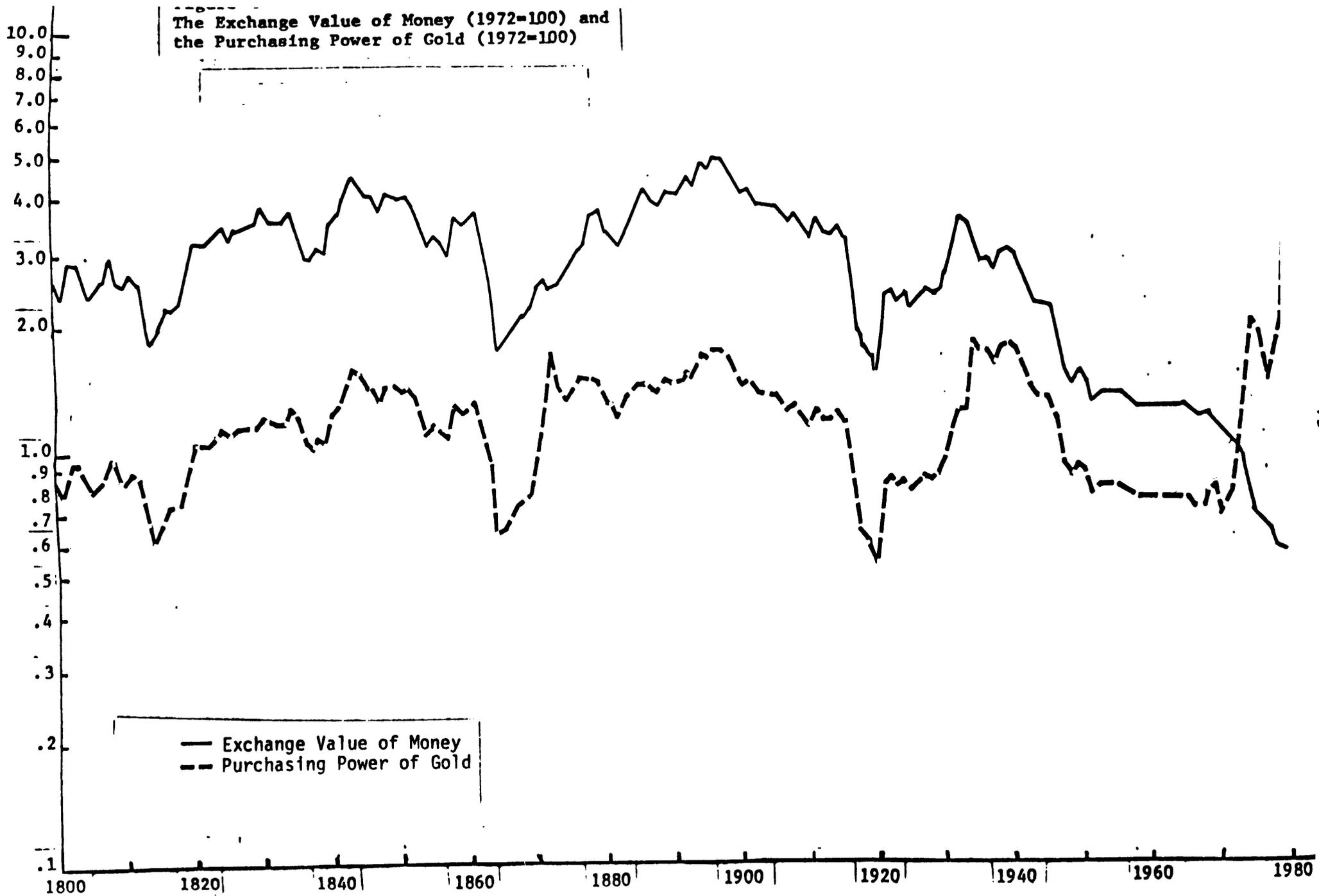
Over shorter periods, the relationship under the gold standard was in the opposite direction. Changes in the monetary gold stock, by influencing changes in the money supply, produced a negative association between the purchasing power of gold and the gold stock. Thus an increase in the gold stock would lead to an increase in the price level and, for a given nominal price of gold, lower the purchasing power of gold. The negative association

may be observed during the gold standard period, changes in the monetary gold stock leading short-term movements in the purchasing power of gold.

Figure 4 compares the exchange value of money, computed as the reciprocal of the wholesale price index, with the purchasing power of gold. The two series are closely related until 1968, when the two-tier market for gold was introduced. The direct relationship until 1968 reflected the existence of a fixed nominal price of gold. The inverse relationship thereafter reflects the increase in private demand for gold as a hedge against inflation and political instability, once private transactions were determined in the free market.

To conclude: The gold standard provided long-term but not short-term price predictability. Long-term inflation or deflation under the pre-World War I gold standard would predictably be reversed as gold output was discouraged or encouraged by decreases or increases in its purchasing power. Thus the price level tended to revert toward a long-run stable value under the gold standard, providing a degree of predictability with respect to the value of money. Subsequent to World War I, the discipline of the gold standard came to be regarded as an impediment to the management of the economy to achieve the objectives of growth and high employment. The deep depressions of the inter-war years were the measure by which the economy under a gold constraint was judged to be a failure. The loosening of the link to gold after World War I and its abandonment fifty years later reduced long-term price predictability. Belief in long-term price stability eroded as public perception of the absence of a long-run constraint on monetary growth took hold. Although price stability was generally included among the goals of the post-World War II era, in fact stability of employment took precedence. In the event, by 1981, neither goal was in sight.

The Exchange Value of Money (1972=100) and
the Purchasing Power of Gold (1972=100)



NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

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To: Members of the Gold Commission
From: Anna J. Schwartz
Date: August 4, 1981
Subject: Summary of Discussion at July 16 Meeting;
Agenda for September 18 and Future Meetings

After a summary of the discussion at the July 16 meeting of the Commission, this memorandum notes issues that were touched on at the meeting that need further examination, and outlines an agenda for the forthcoming September 18 meeting. More topics are listed for discussion than are likely to be covered at the meeting. The agenda for a subsequent meeting will include the topics on the list which will not have been covered plus additional ones that the September 18 meeting may suggest.

Summary of Discussion at the July 16 Meeting of the Commission

Diverse views with respect to monetary standard preferences were expressed by members of the Gold Commission who participated in the meeting on July 16.

- (1) Some members advocated a return to a gold standard, specified as a 100 per cent gold coin standard by one member; others in favor of a gold standard provided no definition of its form.
- (2) Other members rejected any form of a gold standard and proposed maintenance of the current inconvertible paper standard, although at least two members wished it were possible to provide a role for gold under a paper standard, although they were not able to specify one.
- (3) Still other members, while rejecting a gold standard rule, desired a monetary rule for an inconvertible paper standard.
- (4) One member expressed no preference among monetary standards but suggested innovative possible uses of the U.S. monetary gold stock.

At the close of the meeting, Congressman Paul distributed a paper, "1971-1981: A Decade of Inconvertible Paper Money," that he requested serve as the basis for discussion at the forthcoming meeting on September 18.

Members who could not attend the first meeting will have an opportunity at the forthcoming meeting to state their preferences with respect to the monetary standard.

Issues Touched On That Need Further Examination

- (1) A question was raised about the relevance to the work of the Commission of the issue of rules vs. discretion. A return to the gold standard implies the rule of a fixed price for gold at which the monetary authority will buy and sell gold on demand. The alternative policy rule that some members propose is one which limits the rate of growth

of a monetary aggregate to some annual percentage that is consistent with a stable price level. Senator Jepsen's memorandum of July 22 contains a proposal by Robert Weintraub to adopt such a rule. Still other members do not approve of either a gold standard or a policy rule and opt for discretionary monetary growth.

Congressman Paul's memorandum of July 24 suggests that an inconvertible paper money standard subject to a policy rule is "not part of the legislative mandate of this Commission." It is not obvious why discussion should be limited to the evaluation of "the relative social costs of a real gold standard versus those of a discretionary inconvertible paper money system," as the memorandum proposes. It is arguable that the relative social costs of a real gold standard versus those of an inconvertible paper money system subject to a policy rule would differ from the evaluation reached by the former comparison. Why would this information not be relevant to the recommendations the Commission will decide upon?

(2) Some discussion centered on the adequacy of the output of the gold mining industry in the past and in the future. In advance of the next meeting, statistical evidence will be presented to members that will detail the historic, recent past, as well as prospective rates of growth of output of the gold mining industry at various prices per ounce of gold. A reference at the last meeting by some members to a substantial increase in gold output, thanks to the opening of mines in Brazil, needs to be evaluated relative to total world output. An estimate for 1980 shows gold output in Brazil to be less than 4 per cent of total world output. The changing geographical sources of gold output over the historic past will also be detailed.

- (3) The statistical record of the nonmonetary demand for gold by various sources at various prices per ounce of gold and the residual monetary demand will be presented to complement the supply picture.

Agenda for Forthcoming September 18 Meeting and Subsequent Meetings

1. Unfinished business from the July 16 meeting, including procedural issues and issue of extension of date of report.
2. Views of members not present at the July 16 meetings.
3. Representative Paul's memorandum. The memorandum could serve as the point of departure for an examination of the relation between advocacy of a return to the gold standard and the record of the Federal Reserve's problems in controlling monetary growth. Presumably, all members of the Commission share the objective of achieving a stable price level. If that is the objective, is there reason to believe that choosing a gold standard is the only way to achieve it? Some discussion should focus on the possibility of improving current monetary management. Can not the Federal Reserve either on its own initiative or subject to a legislated rule do a better job?

Even so, the question to be answered is, why gold? Gold has to be extracted from the ground at substantial factor costs to be stored above ground. If monetary control is the objective, other commodities are less costly to produce, and could also serve as the standard. The movements of the price of gold since 1968 have not been substantially different from those of an index of commodity prices. If the answer is gold's mystique that other commodities lack, are there ways of exploiting the mystique short of a return to the gold standard? (See point 8 below.)

4. Discussion of the historical chapter on U.S. experience with gold.
Can the evidence that the world progressively abandoned the key features of a fully functioning gold standard be ignored? Why would a return to gold now achieve a different outcome?
5. A vote for the gold standard is a negative vote for a monetary rule governing paper money growth rates. But a vote for the gold standard still has to be supported by evidence on the availability of adequate supplies of gold to support gold-backed monetary growth in the future without inflicting long-term deflationary consequences on the economy. (Evidence will be supplied before the next meeting.)
6. What are the mechanics of the return to gold, basically the determination of the price of gold at which resumption will be undertaken? The basic market forces have to be sorted out from the speculative influences on the price. What role would be assigned to the Federal Reserve System under the gold standard?
7. Apart from the domestic implications of a return to the gold standard, will the decision to return be a unilateral one by the United States? How will financing of the balance of payments be dealt with in that case? How will outstanding dollar liabilities of the United States be handled? If the decision is not to be unilateral but one taken together with the industrialized nations, what preliminary steps are required to achieve their participation?
8. Short of a full-fledged gold standard or a full-fledged paper money standard, is there a restored role for gold either with respect to international payments or domestically? The suggestion by Robert Weintraub should be discussed. Robert Heller, Vice President for International Economics of the Bank of America has written me the following suggestion:

"Simply print on each dollar bill the statement:

'Redeemable into one dollar's worth of gold at any Federal Reserve Bank or the U.S. Treasury.'

"The Federal Reserve would merely be willing to sell gold for dollar bills at the prevailing market price. That would give people confidence that their currency is actually backed by gold, without obliging the authorities to maintain a given price."

Heller does not indicate what disposition the Treasury would make of the dollars it acquired by the redemption process.

With respect to international payments, would revaluing gold at a price higher than \$42.22 per ounce restore its function as a means of settling the balance of payments? How would the price be determined? How would revaluation affect transactions in the private gold market?

9. For those who favor maintenance of the inconvertible paper money standard, and why do not adopt suggestions like those in point 8 above, the question to be discussed is what should be the disposition of the U.S. monetary gold stock. Should it be sold in toto? Is there some stock that should be retained for the sake of portfolio balance? What should be done with the proceeds of the sale?

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

Memorandum

to: Members of the Gold Commission
from: Anna J. Schwartz
date: August 3, 1981
subject: The Role of Gold in U.S. Experience, 1834-1981

Attached is a review of the past role of gold in the U.S. monetary system from 1834 to date. The review is headed Part Two because I anticipate that it will serve as the second part of the report of the Gold Commission. Footnotes will be added when the final draft is presented to the Commission.

The review is a guide to the path by which the United States reached its current domestic and international monetary arrangements. I regard the review as helpful in following the instruction to the Commission in P.L. 96-389 "to conduct a study to assess and make recommendations with regard to the policy of the United States Government concerning the role of gold in domestic and international monetary systems . . ."

Part Two

The Past Role of Gold in the U.S. Monetary System

From 1834 to 1973, with the exception of the years 1862 through 1878 and of an interlude of less than a year's duration in 1933-34, the United States adhered to some form of a gold standard. The purpose of this review is to examine the operation of the successive types of gold standard in U.S. experience, including the evidence for each type on the stability of the price level and of real output, as well as the intervening episodes of floating exchange rates.

Chronologically, U.S. experience with the gold standard may be characterized as follows:

1. 1834-1861: a de facto gold standard in a largely bimetallic international monetary system
2. 1862-78: the greenback standard
3. 1879-1914: a gold standard without a central bank, and a fractional reserve banking system, as part of an expanding international gold standard
4. 1914-1933: a managed gold standard, under the Federal Reserve System, which was legally obligated to maintain minimum gold reserves against its monetary liabilities, in a short-lived postwar international gold exchange standard
5. 1933-1934: a floating dollar in an international monetary system split between a depreciated sterling area and a gold bloc clinging to parity
6. 1934-1948: the interwar and World War II and immediate postwar managed gold standard in a fragmented international monetary system
7. 1948-1968: the Bretton Woods dollar/gold standard system, with progressive dilution of the gold restraints on U.S. monetary conduct
8. 1968-1973: the breakdown of the Bretton Woods system
9. 1973-1981: the United States on an inconvertible paper dollar standard.

U.S. Experience on the Gold Standard

1. 1834-61 -- a de facto gold standard

Before 1879, the United States was legally on a bimetallic standard, but from 1834 on until the Civil War suspension of specie payments, de facto it was on the gold standard. The mint ratio established by the Coinage Act of 1792 and 1792 made the dollar equivalent to 24.75 grains of fine gold/to 371.25 grains of fine silver, or a ratio of 15 to 1. The mint ratio at that time matched the market ratio. Subsequently, a great increase in Mexican silver output led to a decline in the market value of silver relative to that of gold, the ratio approximating 15 1/2 to 1. Hence silver was overvalued at the mint and relatively little gold was brought there. Instead, gold was shipped abroad where the price was higher. De facto during the period before 1834, the United States was on a silver standard.

One June 28, 1834, the Coinage Act of 1834 changed the mint ratio to 16.002 to 1, lessening the weight of a dollar to 23.2 grains of fine gold and leaving unchanged the weight of a dollar of silver. Before 1834, 100 ounces of pure gold or 1500 ounces of pure silver in coin would discharge a debt. After 1834, the debt could be paid with 94 ounces of pure gold in coin.

But since silver was undervalued at the mint, it was driven from circulation. Offering 1475.5 ounces of silver was sufficient at the market ratio to obtain 94 ounces of gold. The Coinage Act in effect debased the currency. Some supporters of the act were aware that it would drive silver out of circulation. It was indeed their objective to achieve a gold standard and a permanent circulation of gold coins. Others urged that as the value of silver relative to gold had been falling for many years before 1834, it would continue to do so in the future and therefore the mint undervaluation of the metal would soon be eliminated. That prediction was wrong.

The act of 1834 was supplemented in 1837 by a law changing the proportion of alloy to pure metal in gold to correspond to that in silver. It established the ratio of alloy at one-tenth, changing the quantity of pure gold from 23.2 to 23.22 grains. For each dollar weight in gold, there is a corresponding price of gold per fine troy ounce of 480 grains ($480/23.22 = \$20.67$). The mint ratio between silver and gold coins became 15.98 to 1 ($371.25/23.22$).

The gold discoveries in Russia, Australia, and California from 1848 on produced a fall in the value of gold, accentuating the discrepancy between the mint and the market ratios. By 1853, a silver dollar was worth about 104 cents of a gold coin, so no one would use silver in settlement of debts. Silver was used as a commodity, not as money. Since subsidiary silver coinage was proportional to the weight of the dollar piece, it also disappeared from circulation. By 1850, there was a gold standard without adequate subsidiary money for retail transactions. The demonetization of silver may be dated from the Act of 1853, rather than the customary date of 1873. The act reduced the number of grains of pure silver in 100 cents from 371.25 to 345.6, a reduction of nearly 7 per cent which exceeded the difference between the value of the gold dollar and the silver dollar. The market value of the pure silver

in subsidiary silver coins was thus less than the gold dollar (first minted in 1849; before **then**, only larger denominations had been coined). The face value of subsidiary coins accordingly was greater than their value as bullion. The supply of subsidiary coins was left to the discretion of the Secretary of the Treasury, and their legal tender limited to a sum not exceeding five dollars. The act also for the first **time** imposed a charge for seigniorage, which until then had been an expense borne by the Government, although subsidiary coins were not subject to seigniorage. (The Resumption Act of 1875 repealed the charge.)

The overvaluation of gold at the mint in 1834 that made the dollar a gold currency, when the United States was legally on a bimetallic standard, was reinforced by the gold discoveries after 1848. In France, also legally on a bimetallic standard from 1803 on, the circulation was almost exclusively silver since the market ratio was higher than the mint ratio of 15 1/2 to 1. When the gold discoveries after 1848 depressed the value of gold, as in the case of the United States, the divergence between the mint and market ratios served to shift the franc to a gold standard de facto. Only Great Britain was on a full-fledged gold standard during the period after 1821, when convertibility was restored after the Napoleonic Wars. Since Great Britain was the world's leading trading country and the London money market was the hub of international capital movements, the gold standard had international scope despite the limited number of countries formally adhering to it.

External and internal shocks interacted during the decade beginning 1834, resulting in a highly unstable performance by the U.S. economy. The chief external shock was British in origin. British eagerness to invest in the United States in the early 1830s necessitated a U.S. trade deficit, made possible by a rise in U.S. prices above those prevailing in Britain. Thanks to an inflow of specie into U.S. bank reserves, the money supply expanded, allowing U.S. prices to rise. (It is not clear that Andrew Jackson's war on the Second Bank of the United States had any independent consequences for monetary expansion.) Ultimately, loss of specie by the Bank of England led it in 1836 to restrain the capital outflow to the U.S. It raised the discount rate in July and August, refused to discount bills of exchange drawn on mercantile houses engaged in the Anglo-American trade, even at the higher rates, and as a result, produced financial pressure in the United States by early 1837.

Simultaneously with the earlier capital outflow from Britain, a surge in British demand for U.S. raw cotton triggered a land boom. Between 1833 and 1836, land sales by the Federal Government at a constant price sextupled. News of the Specie Circular in July 1836, requiring payments to land agents

in specie, concerned the Bank of England because of the implied rise in the demand for specie in the United States. Domestically, the planned distribution to the states in four equal installments (only three took place) of the surplus accumulated by the Federal Government from its land sales, starting January 1, 1837, might also have imposed a hardship on the banks as funds were transferred.

Financial pressure in the United States in early 1837 was aggravated by a fall in the price of cotton, as British demand declined. As a result, debts secured by cotton became frozen, merchants holding such debts went bankrupt, and banks with such loans in their portfolios suspended specie payments as an alternative to the repayment of debts to Britain at a fixed exchange rate. In effect, the United States devalued the dollar during the period of suspension when foreign exchange was available only at a premium.

The suspension continued for a year. In 1838, the economy revived when Britain resumed capital exports, but in 1839, loss of specie again prompted the Bank of England to raise the discount rate. As in 1837, both the supply of capital to the United States and the demand for its cotton fell. The successor Pennsylvania-chartered Bank of the United States, which had extended loans on cotton when the price was high, suspended specie payments in October 1839, followed by banks in the South and West. Nine states defaulted on their bonded indebtedness in 1841 and 1842, shutting off further capital inflows from Europe until the 1850s. Bank failures were widespread, the supply of money fell sharply, and deflation ruled, 1839-42.

Banking panics also occurred in 1847 and 1857, but only the latter one was accompanied by restrictions on convertibility and a premium on gold.

Gold standard experience of the United States before the Civil War was

dominated by the role of the Bank of England. It imposed real adjustment costs on this country. External shocks produced boom and depression that further amplified the effects of internal shocks. Adjustment costs were the price the United States paid for maintaining a fixed exchange rate with sterling. When the costs became excessive, specie payments were suspended.

The record of the quarter-century from 1834 on reveals the magnitude of the adjustment costs. Wholesale prices at annual rates varied as follows:

1834-37 (+8 per cent); 1837-43 (-7 per cent); 1843-47 (+5 per cent);

1847-49 (-5 per cent); 1849-55 (+5 per cent); 1855-61 (-4 per cent).

The estimates of real output for the period 1834-59 are not continuous with the post-Civil War estimates. At annual rates, they also suggest not much greater stability than in wholesale prices:

1834-36 (-1 per cent); 1836-39 (+6 per cent); 1839-40 (-1 per cent);

1840-53 (+6 per cent); 1853-54 (-4 per cent); 1854-59 (+4 per cent).

2. 1862-1878 -- the greenback standard

Early in 1862, convertibility of Union currency into gold was suspended as a result of money creation in the North to help finance the Civil War, disturbances in foreign trade, the general uncertainty arising out of the war, and the borrowing techniques of the Treasury. From then until resumption of specie payments on January 1, 1879, the United States was legally on a fiduciary standard -- the greenback standard. Despite support for inconvertible currency by many business groups before and during the war, and growing farm support after the war, as agricultural prices fell, suspension of payments was generally regarded as temporary.

During suspension, greenbacks circulated side by side with gold, with the price of gold in terms of greenbacks varying from day to day. A floating rate of exchange existed between the two currencies. The major monetary use of gold was for foreign transactions. For foreign payments, gold was equivalent to foreign exchange, since Great Britain in particular maintained a gold standard. Dealers as well as others having extensive foreign transactions therefore found it convenient to maintain gold balances as well as greenback balances. To accommodate them, New York banks, and perhaps others as well, had two kinds of deposit accounts: the usual deposits payable in greenbacks or their equivalent, and special deposits payable in gold. The gold deposits were expressed in "dollars" like the greenback deposits, but that dollar stood for the physical amount of gold that had corresponded to a dollar before the Civil War and was to again after 1879. During the period of suspension, this physical amount of gold was worth more than a dollar in greenbacks -- it was worth well over two dollars in greenbacks from mid-1864 to early 1865.

Gold also retained an appreciable, though minor role, in domestic payments. Customs duties were payable in gold. In addition, the Treasury made virtually all interest and principal payments on its debt in gold at the pre-Civil War monetary value. Some private debt instruments required payment of interest or principal in gold. Finally, the West Coast remained largely on a specie basis. In the rest of the country, prices were quoted in greenbacks, and gold offered in payment was valued at its current market premium in greenbacks. On the West Coast, by contrast, prices were quoted in gold, and greenbacks offered in payment were valued at their current market discount in gold.

Before the Civil War, the exchange rate between the U.S. dollar and the British pound varied around \$4.86 within a narrow interval determined by the costs of shipping gold. From 1862 on, the exchange rate was not so limited

and moved far outside those limits. It was determined by the demand for and supply of foreign exchange, and there were no legal commitments on the part of the United States that prevented the exchange rate from taking any value that was necessary to balance international payments.

The essential requirements for a return to the prewar parity was that the exchange rate so determined be within the initial range determined by the gold points. Once the Civil War was over, the most important factor affecting the exchange rate between the U.S. dollar and the British pound was the movement of internal prices in the United States relative to prices in Britain. A drastic decline in U.S. prices between 1867 and January 1879 made resumption possible. The price index fell at the rate of 5.4 per cent per year. Over the same period, the quantity of money rose at the rate of 1.3 per cent per year. An exceedingly rapid rise in output was the primary factor producing the decline in prices.

Specie resumption was a major political objective of the period and the question whether the government was proceeding toward this objective too rapidly or too slowly was a major political issue. Government action played a minor, if crucial, supporting role in contributing to successful resumption. It may have contributed to the rapid expansion of output through its policies on sale of public land, land grants to railroads, and other similar measures which contributed to the expansion of the West. But such government action was not of the kind that anyone at the time or since would have regarded as explicitly directed toward achieving resumption.

Government action had mixed effects on the mild rate of growth of the quantity of money outstanding. On the one hand, federal and state legislation laid the foundation for the rapid growth of commercial banking, particularly state banks after 1867, that produced increases in the ratios of deposits to reserves and deposits to currency. In addition, the elimination of reserve

requirements against national bank notes in 1874 liberated reserves that encouraged a rise in the deposit-reserve ratio. The rises in the deposit ratios tended to increase the quantity of money outstanding, and thereby to inhibit price declines and to postpone the achievement of the prerequisites for successful resumption. On the other hand, the government did succeed in bringing about a minor reduction in the stock of high-powered money, mostly through use of government surpluses and debt refunding operations to retire Civil War currency issues from 1865 to 1869, and it thereby helped offset to a limited extent the effect of the rises in the deposit ratios.

In view of the recurrent political pressures to expand the greenback issues -- to which the government in fact yielded in 1873-74 -- and the political difficulty then as now of obtaining budget surpluses to retire debt, the achievement of even a minor decline in high-powered money was not a negligible accomplishment.

The Resumption Act of January 14, 1875, which announced the intention to resume specie payments at the prewar parity on January 1, 1879, contained a variety of provisions designed to appeal to silver advocates (replacement of fractional currency -- a Civil War paper issue -- by silver coins); paper-money advocates (removal of existing limits on the aggregate issue of national bank notes and linking the retirement of greenbacks -- the aggregate outstanding not to fall below \$300 million -- to the increase in national banknotes; for every five dollar increase in national bank notes the Treasury was to retire four dollars in greenbacks); gold standard advocates (its main provisions). The act authorized the Secretary of the Treasury both to use surplus revenue and to sell bonds in order to accumulate a gold reserve. At the time, the act was little more than the expression of a pious hope and, insofar as it had any contemporary effect, it was to heighten the opposition to resumption.

That opposition was reflected in the free silver movement that arose in the mid-1870s. The silver commission that was formed late in 1876 by a joint resolution of Congress presented a year later one majority and two minority reports. The majority argued against resumption as "not practicable under the circumstances, until the laws making gold the sole metallic legal-tender are repealed." Some of the majority recommended the old silver dollar of 412.5 grains; the rest recommended a legal relationship between silver and gold of 15.5 to 1 instead of the old relationship of 15.98 to 1, achievable either by reducing the silver content of the silver dollar to 399.9 grains or by increasing the gold content of the gold dollar. They favored the former inflationary effect. One minority report rejected silver as unsuitable for a standard of value but recommended devaluation of the gold dollar by about 2.6 per cent. The second minority report supported the principle of silver remonetization only on condition that an international conference would accept silver as a universal legal tender. There was clearly a range of views on the proper monetary standard, with some diehard attitudes toward resumption at the pre-Civil War parity. Late in 1877, the House passed a bill to repeal the Resumption Act. The bill was defeated in the Senate by one vote. This paper-thin decision turned out to be politically decisive.

The decline in the quantity of money in the last few years before resumption, which helped foster the particularly rapid price decline of those years, in part owed something to the decline in the two deposit ratios associated with bank suspensions in 1877-78, in part to the influence of the Resumption Act. The interpretation of the clause in the Resumption Act requiring a proportionate withdrawal of greenbacks for new national bank notes served to contract the greenback circulation because the voluntary surrender of national bank notes issues by banks retiring their notes was not deducted from the gross increase by other banks.

Both before and immediately after resumption, the Treasury in its re-funding operations went to great lengths to avoid the introduction of even temporary disturbances of any magnitude in the foreign exchange market. In 1877-79, the Treasury refunded about half the average outstanding interest-bearing public debt, to take advantage of lower rates of interest. For foreign holders of securities, calls of old bonds were so timed that one collection of securities was replaced by another or, if offsetting sales of new bonds were not possible, surplus from current account was available to pay for old bonds retired without export of U.S. gold. During these years, in fact, the United States was a net importer of over \$5 million in gold, despite a repatriation of over \$300 million of U.S. government securities by foreigners.

The Resumption Act, and the borrowing and accumulation of a specie reserve under its provisions, had three effects, working in different directions, on resumption.

1. Insofar as the act and the specie reserve instilled confidence in the prospective maintenance of specie payments, it inhibited either a speculative withdrawal of funds from the United States or a speculative accumulation of specie, and enhanced the willingness of foreigners to hold U.S. dollar balances. Had there been no Resumption Act, repatriation by foreigners of U.S. securities in 1876-78 might well have been even greater than it was. More important, by setting a definite exchange rate that was to be attained and a definite date at which it was to be attained, the act offered those speculators with confidence that the government would in fact succeed in achieving those aims an incentive to proceed so as to hold it there. In fact, the monthly average premium on gold dropped below 2 per cent by March 1878 and never thereafter rose above that level. This effect clearly favored resumption.

2. The sale of bonds was an open market operation. The sale of bonds at home for gold was equivalent to selling bonds for greenbacks and then using the proceeds to purchase gold, with the effect of an open market purchase combined with an equivalent open market sale, the two together leaving the total monetary base unaffected. In practice, though gold was not the legal standard, it was used for monetary purposes alongside greenbacks. In consequence, insofar as the gold purchased came from gold held for monetary purposes by either the domestic public or the domestic banks, it did, in the first instance, reduce the reserve basis of the system. However, the banks and others could always replace gold holdings, if they so wished, by purchasing gold or its equivalent, sterling, in the free market at home or abroad and, in fact, that is what happened. The increase in the Treasury's gold reserves was not appreciably at the expense of the high-powered money holdings of the public or the banks.

3. Since gold was the equivalent of foreign exchange, the Treasury's purchase of gold constituted an increase in the demand for foreign exchange. Insofar as it borrowed abroad resources that would otherwise not have been available for loans to this country, it increased the supply correspondingly. But some of its borrowing abroad must have been at the expense of other lending to this country (lending was going on even though the net capital movement from this country was outward); to that extent, the supply was increased less than the demand even by foreign borrowing. Borrowing at home had this effect to an even greater extent. By borrowing at home, the Treasury acquired resources that would have been used in other ways, some of which might have involved a demand for foreign exchange. At most, however, only part of the resources would have been used to purchase foreign exchange, whereas the Treasury used all of them in this way. The result of the greater increase in demand than

in supply was to make the greenback price of sterling higher than it otherwise would have been. The effect therefore made resumption more difficult; it required, that is, a decline in domestic prices sufficient not only to balance foreign payments on current account at the desired exchange rate but also to produce a large enough surplus to finance the accumulation of the specie reserve. Whether the Resumption Act on balance hindered or helped resumption therefore depends on whether this effect was more or less important than the effects on confidence and speculation, and on the growth of high-powered money.

Whatever the conclusion on this score, the cessation of government borrowing to build up a gold reserve, once resumption had taken place, removed a source of pressure on the exchange rate and permitted domestic prices to rise sharply immediately after resumption, without producing balance-of-payment problems.

3. 1879-1914 -- a gold standard without a central bank

The success of resumption did not end uncertainty about the monetary standard. For nearly two decades thereafter, the U.S. financial scene was dominated by controversy, which had started in the seventies, over the place of silver in the monetary system.

The rapid expansion of output in the Western world during those decades and the adoption of a gold standard over an area far wider than before added substantially to the demand for gold for monetary purposes at any given price level in terms of gold. That expansion in demand more than offset a contemporary expansion in supply, as a result both of increased production of gold and improvement of financial techniques in erecting a larger superstructure of money on a given base of gold. The result was a slow but rather steady downward tendency in product prices that prolonged and exacerbated the political discontent initiated by the rapid decline in prices after the end of the Civil War. "Greenbackism" and "free silver" became the rallying cries. The silver

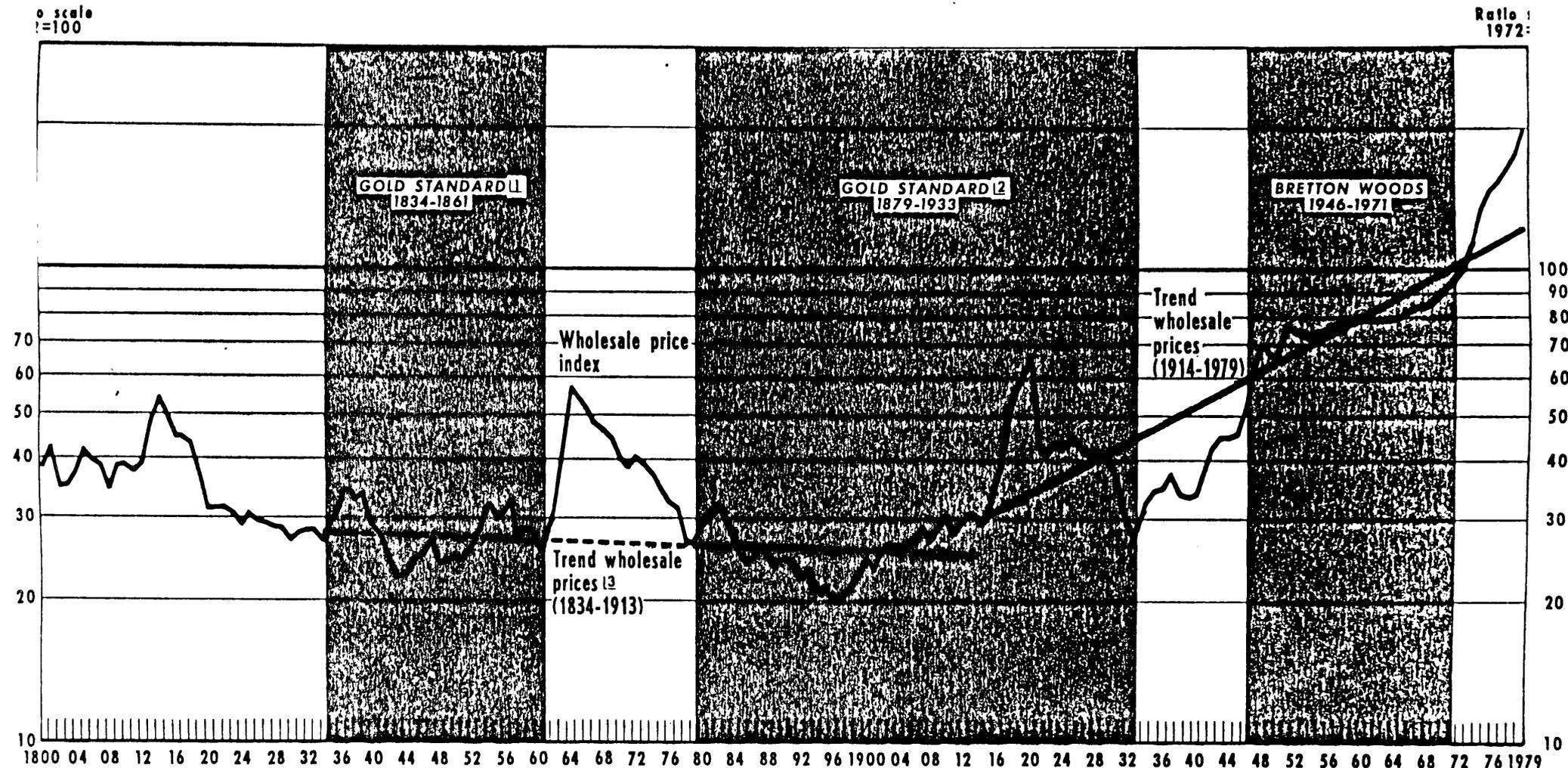
forces were strong enough to obtain concessions that shook confidence in the maintenance of the gold standard, yet they were not strong enough to obtain the substitution of silver for gold as the monetary standard. The monetary history of this period is therefore^{one}/of repeated crises and of legislative backing and filling. The defeat of William Jennings Bryan in the Presidential election of 1896 marks in retrospect the end of the period.

Bryan's defeat happened to follow gold discoveries in South Africa and Alaska and the perfection of the cyanide process for extracting gold. These developments produced a rapid expansion of the world's production of gold, sufficiently large to force an upward price movement over the next two decades despite a continued growth in world output. The accompanying gradual rise in prices rendered the gold standard secure and unquestioned in the United States until World War I.

Monetary disturbances during the period from 1879 to 1914 were associated with banking difficulties in 1873, 1884, 1890, 1893, and 1907. Under a fractional reserve banking system, the public's withdrawal of currency from the banks not only reduced the banks' reserves but also produced a multiple contraction in deposits. In some episodes, as in the period 1834-1861, the banks restricted convertibility of deposits into currency. As a consequence, currency sold at a premium, which was equivalent to a depreciation of the deposit dollar in terms of gold or foreign exchange. These monetary disturbances, however, were attributable to the U.S. banking structure rather than the gold standard system. The need for reform of the banking structure was widely acknowledged after 1907.

To form a judgment about U.S. experience under the gold standard, we can examine from 1870 the behavior of prices and of real per capita output (Figures 1 and 2), and from 1879, of the monetary gold stock and the purchasing power of gold (Figure 3). (Figures follow on pp. 15a, 15b, 15c.) The

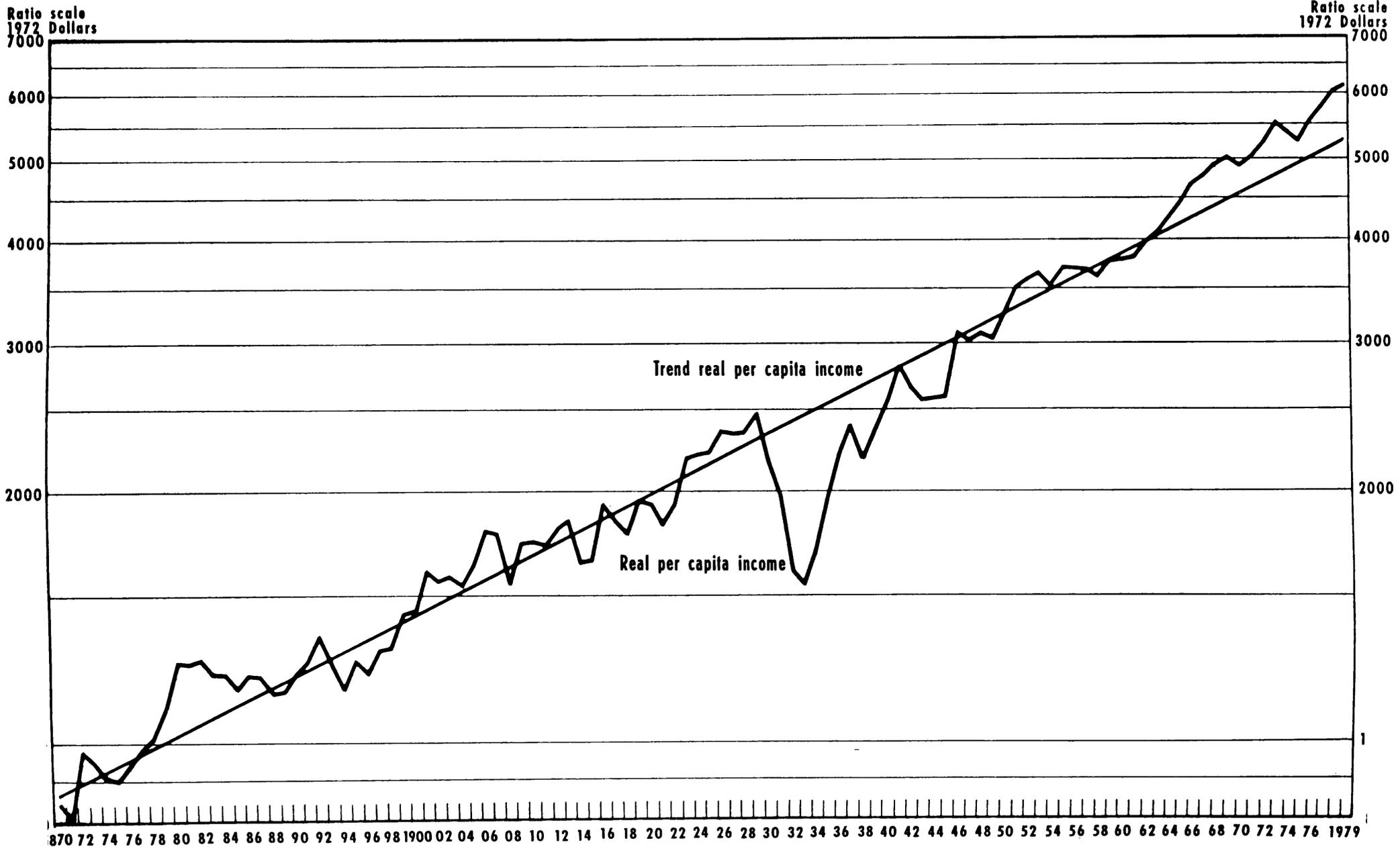
Figure 1
Wholesale Price Index, United States



(1) Excludes 1838-1843 when specie payments were suspended.
 (2) United States imposes gold export embargo from September 1917 to June 1919.
 (3) Broken line indicates years excluded in computing trend.

Prepared by Federal Reserve Bank of St. Louis

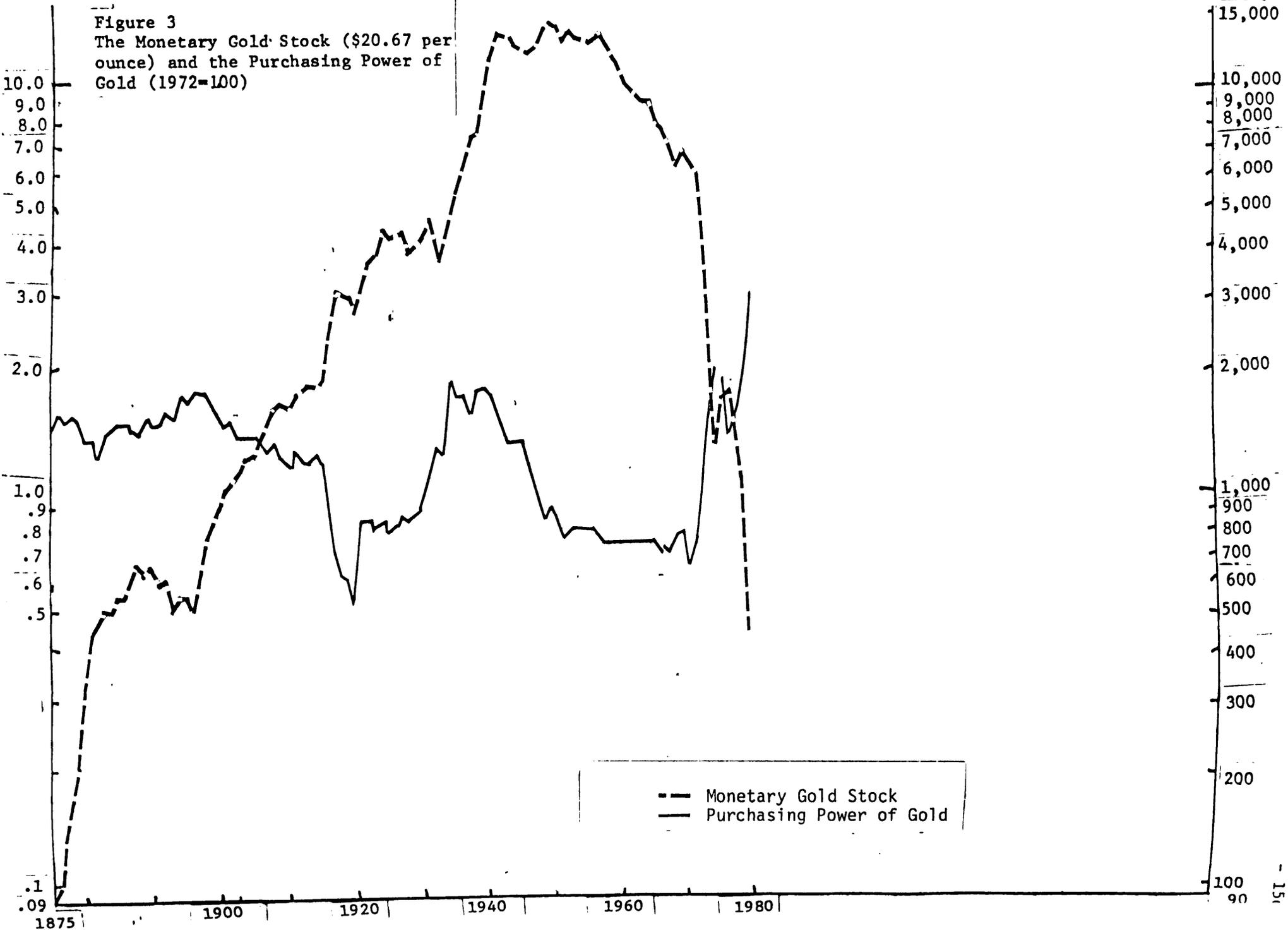
Figure 2
Real Per Capita Income, United States



Index Number

Millions of \$

Figure 3
The Monetary Gold Stock (\$20.67 per ounce) and the Purchasing Power of Gold (1972=100)



--- Monetary Gold Stock
 — Purchasing Power of Gold

trend of the wholesale price index for the period 1834-61 and 1879-1914 was slightly downward, with a marked degree of variance about the trend. Despite a sharp decline in the annual estimates from 1890 to 1896, the trend of the U.S. monetary gold stock was positive from 1879 to 1914. The trend of the purchasing power of gold was negative (a rising price level), reflecting the more rapid growth in U.S. monetary gold than in real output over that period. Deviations from trend in the monetary gold stock were negatively associated with deviations from trend in the purchasing power of gold, with some tendency for the purchasing power deviations to lead the monetary gold stock deviations. This would be consistent with a tendency for the price level to revert towards a long-run stable value under the pre-World War I gold standard, though over the short run inflation or deflation was experienced.

As might be expected, the trend of U.S. real per capita income was strongly positive from 1870 to 1914, but with substantial variance about the trend.

In sum, contemporaries regarded the pre-World War I gold standard as a successful commodity standard, international in scope from the late nineteenth century on. It provided long-run stability despite short-term price instability. Years might elapse before a tendency to decline or rise in the price level was reversed. Real output growth around a rising trend was not steady but the instability was attributed to special features of the U.S. banking structure.

Relative to Great Britain, the United States was only a small country in the world economy. The Bank of England dominated the world economy, influencing international flows of capital, managing the gold standard on a narrow gold base,

so that the rest of the world had to keep in step with its actions. With the monetary systems of many countries linked together through fixed exchange rates, international payments imbalances led to movements in money supplies, price levels, the relative prices of exports and imports, incomes and interest rates.

The extent to which these results were due to relative international peace, relatively free international trade, factor mobility within and across countries, the concentration of world capital and money markets in London, and the willingness of gold standard countries to maintain fixed parities can be judged by comparison with the absence of these conditions in the post-World War I decades.

4. 1914-1933 -- a managed gold standard

The Federal Reserve Act was passed in 1913 under peacetime conditions when it was taken for granted that the gold standard would prevail. The Act included a gold standard rule incorporated in gold reserve requirements for Federal Reserve notes and deposits and also a "real bills" rule, according to which the criterion for determining the quantity of money would be linked to "notes, drafts, and bills of exchange arising out of actual commercial transactions" (section 13), offered for discount at rates to be established "with a view of accommodating commerce and business" (section 14d). Both were regarded as quasi-automatic in their operation. Taken literally, the two rules were contradictory. Maintenance of the gold standard means that the stock of money must be whatever is necessary to balance international payments. The real bills rule sets no effective limit to the quantity of money.

The act was no sooner passed than the conditions taken for granted ceased to hold. Before the System began operations in November 1914, World War I had begun. Very soon the belligerents effectively left the gold standard and

a flood of gold started coming to the United States to pay for purchases by the Allies. Between September 1917 and June 1919 the United States controlled gold exports by export licenses and in effect suspended interconvertibility between paper money and gold. The gold standard criterion set a largely ineffective limit on the total quantity of money. A worldwide gold standard was re-established for a brief period in the 1920s, yet the gold standard never again played the role that the framers of the act took for granted. The real bills criterion fared no better. Once the United States entered the war, loans on government securities began to rival commercial paper as collateral for Reserve Bank rediscounts. The Reserve System was authorized to issue notes against rediscounted assets other than commercial paper, mainly members' 15-day notes secured by government bonds. Thus the Federal Reserve System began operations with no effective legislative criterion for determining the quantity of money.

This conclusion can be documented by comparing the actual course of events with what would have happened under a fully operative gold standard. The war-time experience under a gold standard might not have differed from what actually occurred: the large inflow of gold up to the entry of the United States into the war would have produced a price rise through 1918 similar to actual experience. The big difference would have emerged between the end of the war and 1920 when nearly half of the monetary expansion from 1914 on occurred because the Federal Reserve subordinated monetary policy to the alleged necessity for facilitating Treasury funding of the floating debt plus unwillingness to see a decline in the prices of government bonds. The monetary expansion and the accompanying inflation led to an outflow of gold after the lifting of the embargo despite the great demand abroad for U.S. exports and despite the departure of most countries from a fixed parity between their

currencies and either gold or the dollar. The ensuing decline in the reserve ratio of the Federal Reserve System finally compelled action to slacken monetary growth. The initial action -- a sharp rise in discount rates in January 1920 -- produced a reversal of the gold outflow in May. The following action -- a second rise in discount in June 1920 rates to the highest level in Federal Reserve history until 1973 -- was a deliberate act of policy involving a reaction stronger than was needed, since a gold inflow had already begun. It was succeeded by a heavy gold inflow and a negative rate of monetary growth over the following year. Wholesale prices were nearly halved by June 1921 from their level in May 1920. Real output fell precipitously.

The postwar increase in the quantity of money occurred because the Reserve System did not observe the rules of the gold standard but exercised discretion. The subsequent collapse occurred because the power to manage money was not limited by the requirement to maintain gold reserve requirements. Had there been no discretion, neither the postwar increase, nor the postwar collapse need have occurred.

The price and output movements of the post-World War I years in this country were part of a worldwide movement. Throughout most of the world, for victors, vanquished, and neutral alike, prices rose sharply before or into 1920 and fell sharply thereafter. About the only countries that escaped the price decline were those that were to experience hyperinflation. Though many national currencies were not rigidly tied either to gold or to the dollar, central bank policies nevertheless produced linkages sufficiently strong to result in common movements of prices in most national currencies. Flexible exchange rates were regarded as a temporary expedient pending return to gold, and monetary authorities everywhere sought to facilitate such a return

to fixed parities. The results under managed fiduciary currencies were therefore similar to those that would have been experienced with fixed parities.

During the balance of the 1920s, the Federal Reserve System did not permit gold movements to affect the quantity of money outstanding. Inflows were offset by open market sales, outflows, by open market purchases. Federal Reserve credit after 1923 moved inversely with movements in the gold stock. The System achieved stable economic growth with falling wholesale prices, but this achievement was largely at the expense of economic stability in Great Britain and the peripheral countries tied to sterling. Britain's return to gold in 1925 at a parity that overvalued sterling would have caused her less difficulty if prices in the United States had risen instead of falling thereafter. The United States would then have gained less gold or lost some, and the pressure on the pound would have been eased. When France returned to gold at a parity that undervalued the franc and also did not permit gold inflows to affect its money stock and prices, the British position was further undermined.

The monetary standard to which most countries had returned by 1929 was the gold-exchange standard. They kept their monetary reserves in the form of balances of other currencies convertible into gold at fixed prices, notably sterling and dollars, rather than in the form of gold itself. Official agencies in such countries, usually the central banks, often fixed exchange rates directly by standing ready to buy or sell the national currency at fixed rates in terms of other currencies, rather than indirectly by standing ready to buy or sell gold at fixed prices in terms of the national currency.

Since the gold-exchange standard, like the gold standard, involved fixed exchange rates, it also meant that, so long as the standard was maintained, prices and incomes in different countries were intimately connected. They had

to behave so as to preserve a rough equilibrium in the balance of payments among countries. The gold-exchange standard, however, made the international financial system more vulnerable to disturbances because it raised the ratio of claims on gold available to meet those claims.

The links forged by fixed rates of exchange ensured a worldwide decline in income and prices after 1929. The evidence is clear that the United States was in the van of the movement and not a follower. If declines elsewhere were being transmitted to the United States, the transmission mechanism would be a balance of payments deficit in the United States as a result of a decline in prices and incomes elsewhere relative to prices and incomes in the United States. That decline would lead to a gold outflow from the United States which, in turn, would tend -- if the United States followed gold-standard rules -- to lower the stock of money and thereby income and prices in the United States. However, the U.S. gold stock rose during the first two years of the 1929-33 contraction and did not decline, demonstrating that other countries were being forced to adapt to our monetary policies rather than the reverse.

The international effects were severe and the transmission rapid, not only because the gold-exchange standard had rendered the international financial system more vulnerable to disturbances, but also because the United States did not follow gold-standard rules. The Federal Reserve did not permit the inflow of gold to expand the U.S. money stock. It not only sterilized it, it went much further. The U.S. quantity of money moved perversely, going down as the gold stock went up. In August 1929, at the start of the business contraction, the U.S. quantity of money was 8.3 times the gold stock; by August 1931, it was 10.6 times the gold stock;/ The result was that other countries not only had to bear the whole burden of adjustment but also were faced with continued additional disturbances in the same direction, to which they had to adjust.

The effects first became severe in those countries that had returned to gold with the smallest actual gold reserves, and whose financial structure had been most seriously weakened by World War I -- Austria, Germany, Hungary, and Rumania. To shore up the financial systems of those countries, international loans in which the Reserve System participated, were arranged. But so long as either the basic pressure on those countries deriving from deflation in the United States was not relieved, or the fixed exchange-rate link which bound them to the U.S. dollar was not severed, such assistance was at best a temporary palliative. In country after country, that is what it proved to be. As they experienced financial difficulties, the United States was in turn affected by the reflex influence of the events it had set in train.

The first major country to cut the link was Britain, after runs on sterling precipitated by France and the Netherlands. Britain abandoned the gold standard in September 1931. The international monetary system split in two, one part following Britain to form the sterling area; the other following the United States, in the gold bloc. The trough of the depression in Britain and in other countries that accompanied Britain in leaving gold was reached in the third quarter of 1932.

In the two weeks following Britain's departure from gold, central banks and private holders in a number of foreign countries converted substantial amounts of their dollar assets in the New York money market to gold. The U.S. gold stock declined by the end of October to about its level in 1929. The Federal Reserve System, which had not responded to an internal drain from December 1930 to September 1931 as a series of runs on banks, bank failures, and shifts from bank deposits to currency by anxious depositors produced downward pressure on the U.S. quantity of money, responded vigorously

to the external drain. A sharp rise in discount rates ended the gold drain temporarily but intensified bank failures and runs on banks. In 1931, unlike the situation in 1920, the System's reserve ratio was far above its legal minimum. The System overreacted to the gold outflow and magnified the internal drain.

The Federal Reserve System justified its passivity in relation to the internal drain by reason of a shortage of free gold. The law specified that the System hold against Federal Reserve notes outstanding, the volume of which had increased with the internal drain, a reserve of 40 per cent in gold and additional collateral of 60 per cent in either gold or eligible paper (which consisted of commercial, agricultural, or industrial loans, or loans secured by U.S. government securities rediscounted by member banks; loans to member banks secured by paper eligible for rediscount or by government securities; and bankers' acceptances, i.e., "bills bought" in Federal Reserve accounting terminology). Because the System did not have enough eligible paper to furnish 60 per cent of the collateral for Federal Reserve notes, part of the gold in excess of minimum requirements had to be pledged for this purpose. The amount of gold not needed to meet either minimum gold requirements or collateral requirements was therefore less than the amount of excess gold reserves. The Federal Reserve System asserted that the shortage of free gold was an important factor preventing the System from engaging in open market purchases. Such purchases would have reduced eligible paper holdings still further by reducing rediscounts and therefore could have been conducted only to a very limited extent without eliminating free gold entirely. Whatever the validity of the Federal Reserve view, the Glass-Steagall Act of February 27, 1932, disposed of that problem by permitting government bonds in the Reserve Banks' portfolios as well as eligible paper to serve as collateral against Federal Reserve notes in addition to the 40 per cent minimum gold reserve.

The downward movement of money, income, and prices in the United States was reversed for a few months in the second quarter of 1932, when the Federal Reserve finally undertook a program of open market purchases, following which there was a widespread revival in the real economy in the summer and fall. The termination of the program during the summer was followed in the six months from October 1932 by mounting banking difficulties, leading to state banking holidays. By February 1933, fears of a renewed foreign drain added to the general anxiety. For the first time, also, the internal drain partly took the form of a specific demand for gold coin and gold certificates in place of Federal Reserve notes or other currency. The Federal Reserve System reacted as it had in September 1931, raising discount rates in February 1933 in reaction to the external drain but not seeking to counter either the external or internal drain by extensive open market purchases. In the first few days of March, heavy drains of gold, both internal and external, reduced the New York Federal Reserve Bank's reserve percentage below its legal limit. With some reluctance, the Federal Reserve Board suspended reserve requirements for thirty days. On March 4, the Federal Reserve Banks remained closed as did all the leading exchanges. A nationwide banking holiday was proclaimed after midnight on March 6 by the incoming administration. All banks were closed until March 9 and gold redemption, gold shipments abroad or dealing in foreign exchange were suspended during the bank holiday. The Emergency Banking Act of March 9, 1933, granted the President emergency powers over banking transactions and over foreign exchange dealings and gold and currency movements. The next day, March 10, the President issued an executive order extending the restrictions on gold and foreign exchange dealings beyond the banking holiday proper and, in effect, prohibiting gold payments by banking and nonbanking institutions alike, unless permitted

by the Secretary of the Treasury under license. These measures were the precursors to a far-reaching alteration in the legal structure of the monetary standard.

5. 1933-1934 -- a floating dollar

Despite the effective suspension of gold payments in March 1933, the price of gold or the rate of exchange between the dollar and currencies that remained rigidly linked to gold, hovered around "par" for over a month. The suspension was regarded as part of the banking emergency and hence expected to be temporary; foreign exchange transactions were strictly controlled and limited; the administration made no official announcement that it proposed to permit the dollar to depreciate or be devalued; and after some weeks, several licenses to export gold were granted. Moreover, the technical gold position was sufficiently strong so that there was little doubt the preceding gold parity could have been maintained if desired; the ratio of the gold stock to the total stock of money was higher than at any time since 1914.

One important step, unprecedented in the United States, was taken during this period. On April 5, an executive order forbade the "hoarding" of gold and required all holders of gold, including member banks of the Federal Reserve System, to deliver their holdings of gold coin, bullion, or certificates to Federal Reserve Banks on or before May 1 except for rare coins, reasonable amounts for use in industry and the arts, and a maximum of \$100 per person in gold coin and gold certificates. The gold coin and gold certificates were exchanged for other currency or deposits at face value, and the bullion was paid for at the legal price of \$20.67 per fine ounce. The "nationalization" of gold outside Federal Reserve Banks was later completed by order of the Secretary of the Treasury, dated December 28, 1933, excepting only rare coins and a few other minor items from the requirement that all

gold coin, gold bullion, and gold certificates be delivered to the Treasurer of the United States at face value corresponding to the legal price of \$20.67 per fine ounce. The expiration date for the surrender of gold was later set as January 17, 1934, when the market price of gold was in the neighborhood of \$33 per fine ounce.

An executive order of April 20, 1933, extending and revising the gold embargo, and comments by the President at his news conference the preceding day ended the period of stability in the price of gold. The President made it clear that the administration intended to permit the dollar to depreciate in terms of foreign currencies as a means of achieving a rise in domestic prices. The order applied the restrictions on foreign exchange transactions not only to banks licensed under the executive order of March 10, but also to all persons dealing in foreign exchange. On the same day, the Thomas amendment to the Agricultural Adjustment Act was offered in Congress. The amendment enacted into law on May 12, and explicitly directed at achieving a price rise through the expansion of the money stock, contained a provision authorizing the President to reduce the gold content of the dollar to as low as 50 per cent of its former weight. The dollar price of gold immediately started rising, which is to say that so also did the dollar price of foreign currencies, including those like the French franc that remained on gold and those like the pound sterling that had gone off gold at an earlier date. In the next three months, the market price of gold rose to \$30 an ounce, and thereafter fluctuated erratically between a low of about \$27 and a high of nearly \$35 until January 30, 1934, when the Gold Reserve Act was passed. During that period, the United States had a floating exchange rate determined in the market from day to day, as in the period from 1862 to 1879. However, there was considerably greater government interference in the market. On

September 8, 1933, an official gold price, to be fixed daily at the estimated world market figure less shipping and insurance cost, was established. The Treasury agreed to buy gold at that price to give American miners a price as high as they could have obtained by export in the absence of the export embargo.

Starting in October, the government intervened actively to raise the price of gold. The Reconstruction Finance Corporation was authorized to buy newly mined domestic gold from October 25 on, and a few days later, through the agency of the Federal Reserve Banks, to buy gold abroad. The purchase price was raised almost daily. For a time, the large-scale RFC purchases abroad made the announced price for newly-mined domestic gold the effective market price. From the end of November, however, until the end of January 1934, the announced price exceeded the market price abroad.

The aim of the gold policy was to raise the prices of farm products and raw materials. Most farm products and raw materials exported by the United States had a world market, hence the decline in the foreign exchange value of the dollar meant a roughly proportional rise in the dollar price of such commodities as cotton, petroleum products, leaf tobacco, wheat, and similar items.

The decline in the foreign exchange value of the dollar was initially a product of speculative sale of dollars in the expectation of devaluation -- a short-term capital outflow. The decline was sustained by shifts in the demand schedules for imports and the supply schedules of exports produced by the cessation of internal deflation. Prices rose in the United States relative to prices in other countries. If the exchange value of the dollar had not fallen, the price rise would have discouraged exports and encouraged imports. These forces were subsequently reinforced by U.S. purchase of gold at home and abroad.

U.S. purchase of gold involved a reduction in the supply of goods for export, since gold is a potential export good, and hence a reduction in the demand for dollars by holders of other currencies (to buy the domestically produced gold). The purchase of foreign gold involved an increase in the demand for goods for import (namely, gold) and hence in the supply of dollars offered in exchange for foreign currencies (to buy foreign gold). The combined effect was to create a potential deficit in the U.S. balance of payments at the former exchange rate. Given a flexible rate, the potential deficit was closed by a depreciation of the dollar sufficient to generate, through an increase in exports or a decline in imports or a movement of speculative funds, an amount of foreign currencies exceeding the amount demanded for other purposes by enough to pay for the gold.

These effects depended very little on the fact that gold was the commodity purchased. Given a floating exchange rate, essentially the same effects on the dollar prices of internationally traded goods would have followed from the same dollar volume of government purchase of wheat or perfume, or from the economically equivalent program, adopted after World War II, of building up stockpiles of foreign-produced strategic goods. As it was, the use of gold as the vehicle necessarily meant an accumulation of gold, just as the use of wheat or perfume would have meant the accumulation of that commodity.

The choice of gold as the vehicle did have an important effect on the impact of the program on foreign countries. In the first place -- and a corresponding effect would be present for any particular commodity -- the program had a special impact on gold-producing countries. In the second place -- and this effect would be present only for a commodity serving as the basis of a monetary standard -- it had a special impact on gold-standard countries. Being committed to sell gold at a fixed price in terms of their

own currency, these countries necessarily experienced pressure on their gold reserves, which in turn necessitated either abandonment of the gold standard or internal deflationary pressure. Those countries were placed in the position of having to adjust downward their whole nominal price level.

The device used to achieve a decline in the exchange value of the dollar -- borrowing funds (through the issue of RFC securities) to purchase gold -- was not unprecedented. The identical device was employed before 1879 but that time for precisely the opposite purpose: to promote a rise in the exchange value of the dollar. As noted above, the mechanical as opposed to the psychological effects of the accumulation of a gold reserve rendered resumption more rather than less difficult.

A major obstacle to using gold as a vehicle for lowering the exchange value of the dollar and thereby raising prices was the existence of the so-called gold clause in many government and private obligations and in private contracts. That clause, whose use dated back to the greenback period after the Civil War, required payment either in gold proper, or in a nominal amount of currency equal to the value of a specified weight of gold. It was designed precisely to protect lenders and others against currency depreciation. This clause, if honored, would have multiplied the nominal obligations of the federal government and of many private borrowers for interest and principal of debt by the ratio of the new price of gold to the old price of gold. Accordingly, a joint resolution was introduced in Congress on May 6 and passed on June 5, 1933, abrogating the gold clause in all public and private contracts, past and future. In February 1935, the Supreme Court, by a five-to-four decision, in effect upheld the constitutionality of that resolution. Not until the act of October 28, 1977, was the prohibition against gold clauses removed, and express allowance for their use provided.

At the outset, the gold policy was one of two mutually inconsistent policies with respect to the monetary standard simultaneously pursued by President Roosevelt. The other was the organization of a World Monetary and

Economic Conference which convened in London, June 1933. President Hoover had set in train the arrangements for the convocation of the conference in May 1932, and it was originally scheduled to be held in January 1933. The aim of the conference was to achieve cooperative action on international economic problems, and hopes were high that it would produce an agreement stabilizing foreign exchange arrangements. But the conference was nearly a complete failure. One reason was that, while it was in process, the President apparently decided definitely to adopt the path of currency depreciation. He sent a message to the conference on July 2, 1933, which dissociated the United States from any attempt to achieve what was described as a "temporary and probably an artificial stability in foreign exchange on the part of a few large countries" and was termed a "specious fallacy." The message was at the time given much of the public blame for the failure of the conference. However, whatever the President might have said and however consistent U.S. policy might have been, it seems dubious that the economic preconditions existed for a viable exchange stabilization agreement. The fundamental difficulties were the probable incompatibility of the exchange rates of the sterling bloc and of the nations that still remained on gold, and the unwillingness at the time of the gold-bloc countries to change their gold parities.

The period of a variable price for gold came to an end on January 31, 1934, when the President, under the authority of the Gold Reserve Act passed the day before, reduced the gold content of the dollar to 13.71 grains and thus specified^a buying and selling price of \$35 an ounce for gold ($480/13.71 = \35). He thereby devalued the gold dollar to 59 per cent of its former weight. Under the terms of the act, title to all gold coin and bullion was to be vested in the United States; all gold coins were to be withdrawn from circulation and melted into bullion and further gold coinage was to be discontinued; the

Secretary of the Treasury was to control all dealings in gold; and the President was authorized to fix the weight of the gold dollar at any level between 50 and 60 per cent of its prior legal weight.

Since the Treasury had formerly valued its own gold holdings at \$20.67 an ounce, and paid only that price for gold it acquired from private individuals, commercial banks, and the Federal Reserve System, it realized a large "paper" profit from the revaluation of the dollar; which is to say, the Treasury could print additional paper money entitled "gold certificates" to a nominal value of nearly \$3 billion without acquiring additional gold and yet conform to the legal requirement that it hold a specified weight of gold (now less than before) for each dollar printed. Those gold certificates could not be legally held by private individuals, but they could be held by Federal Reserve Banks. Accordingly, to realize its "profits," the Treasury had to turn over gold certificates to the Federal Reserve System, receiving in return a deposit credit that it could convert into Federal Reserve notes or pay out by check. Stripped of its legal trappings, the economic effect was identical with a simple grant of authority to the Treasury to print and put in circulation nearly \$3 billion of fiat currency in addition to the \$3 billion in greenbacks already authorized by the Thomas Amendment to the Agricultural Adjustment Act.

Of the paper profit, \$2 billion was assigned to a stabilization fund set up under the control of the Secretary of the Treasury and authorized to deal in gold, foreign exchange, securities, and other credit instruments for the purpose of stabilizing the exchange value of the dollar. Of the balance of the paper profit, \$645 million was used for the redemption of national bank notes, which simply substituted one form of fiduciary currency for another; \$27 million was transferred to the Federal Reserve Banks for making industrial loans; \$2 million was charged off to losses in melting gold coin; and \$141 million remained in the General Fund cash balance.

Thus the interlude during which the United States was not on a gold standard was concluded. The type of gold standard on which it operated thereafter is the subject of the section that follows.

6. 1934-1948 -- the interwar, World War II, and postwar managed gold standard

The official price of gold remained fixed at \$35 an ounce from February 1, 1934, until March 31, 1972, when the official price was altered to \$38. In this sense, the date in 1934 marked the return to a gold standard. But the gold standard to which the United States returned was very different, both domestically and internationally, from the one it had left less than a year earlier. The mint bought all gold offered to it at the price of \$35 an ounce but sold only for the purpose of foreign payment. The holding of gold coin and bullion was forbidden to private individuals in the United States, except for use in industry and the arts and for numismatic holdings, and gold no longer circulated domestically. The Federal Reserve continued to have a gold reserve requirement, but the state of the reserve was not a direct influence on policy at any time from 1933 until the threatened depletion of the gold reserve in the period from 1948 to 1968, under the Bretton Woods arrangements. In 1945, when the System was approaching the then existing requirement (40 per cent for Federal Reserve notes and 35 per cent for Federal Reserve deposits), the law was changed to require a uniform 25 per cent.

Fixed buying and selling prices for gold were no longer the main reliance for maintaining rigid exchange rates with other currencies, even those of countries nominally on gold. Instead, a new central bank organ was created, the stabilization fund, with powers to engage in open market purchase and sale of foreign exchange and nonmonetary gold to influence exchange rates.

During the late 1930s, most of the so-called gold-bloc countries finally left gold, and nominally floating exchange rates with government speculation through stabilization funds became the rule. During the war, many countries fixed "official" exchange rates but sought to maintain them by extensive control over foreign exchange transactions, imitating the devices developed by Hjalmar Schacht for Germany in the 1930s, rather than by free purchase or sale at fixed prices of either gold or foreign exchange. Since then, an even wider variety of actual exchange rates came into use.

After 1934, the role of gold in the United States was not that of the base of the monetary system. Rather it became a commodity whose price was officially supported in the same way as the price of wheat, for example, was under various agricultural support programs. The major difference is that the support price for agricultural products was paid only to domestic producers, the gold-support price to foreign as well as domestic. In addition, the agricultural products accumulated were freely sold at the support prices to anyone, the gold only to certain foreign purchasers and not to any domestic ones. In consequence, the gold program set a floor under the world price of gold in terms of dollars.

The substitution in 1934 of a fixed price for gold, rather than a variable price as under the earlier purchase program in 1933 and early 1934, meant that the number of dollars spent on gold was no longer under the direct control of U.S. authorities. Having fixed the price, they were committed to buy all that was offered. But the effects of such purchases were the same as under the earlier program. For the United States, the purchases meant an increase in the dollar value of other exports relative to the dollar value of imports, thanks to a rise in prices of internationally traded goods relative to domestic goods through the combined effect of changes in exchange rates and in domestic

price levels of the various countries. For gold-producing countries, the purchases meant an increased price for one of their products, hence an expansion in the gold industry relative to other industries and a rise in income. For gold-standard countries, the price fixed for gold in the United States determined the rate of exchange between their currencies and dollars. They either had to adjust their internal price level to that new rate -- in the process presumably disposing of some of their reserves as measured in ounces of gold -- or to change their own fixed price of gold. For all gold-standard and gold-producing countries except the United States and for nongold-standard and nongold-producing countries, the gold purchases meant a reshuffling of international trade in response to a decreased U.S. demand for products other than gold, and an increased demand for such products by gold-producing countries; the program meant an increased supply of products from the United States and a decreased supply from gold-producing countries. Finally, international trade had to adjust to measures adopted by gold-standard countries to meet loss of their reserves.

The price fixed for gold initially overvalued the product and therefore stimulated a rapid increase in production and a rapid accumulation of government stocks. Production in the United States including its possessions rose from less than 2.6 million ounces in 1933 to 6 million in 1940; in the world from 25 million ounces in 1933 to 41 million in 1940. The rise in prices of other commodities and services from 1940 to 1948 lowered the relative price of gold and reduced U.S. gold output (1948) below its 1933 level, though world output still exceeded the level of that year.

There was an initial sharp jump in the U.S. gold stock from January to February 1934 that was accounted for primarily by the revaluation of gold, but part was produced by the substantial amount of gold imported, as foreigners took advantage of the higher buying price that became official on January 31.

Gold was almost immediately shipped to the United States. In the six weeks from February 1 to March 14, more than \$0.5 billion of gold (valued at the new price) was imported. Once the initial rush of gold imports ended, the gold stock continued to rise at a fairly steady rate to the end of 1937. -

Until France left gold in late 1936, roughly half of U.S. gold imports came from France. For the next year, France was a net importer of gold from the United States rather than a net exporter. During the last quarter of 1937, a large-scale withdrawal of foreign short-term balances followed rumors that further devaluation of the dollar was being considered as a possible counter-cyclical measure. Withdrawal of European short-term funds from the United States ceased in July 1938. These counter movements roughly offset the forces making for a continued flow of gold to this country, so the total gold stock remained fairly steady from autumn 1937 to autumn 1938. Munich then led to a further flight of capital from Europe and a sudden increase in the rate of gold inflow. The outbreak of war simply maintained the rate of the gold inflow. The intensification of Britain's war effort after the fall of France in early 1940 and her attempt to tap American supplies of war material, as she had in World War I, produced a further increase. Finally, the enactment of lend-lease in early 1941, which relieved Britain and her allies of the necessity of acquiring dollars to finance war purchases, brought an end to the rapid growth of the gold stock. In sum, the gold stock in the Treasury rose from 200 million ounces when the support price was fixed in early 1934 to 630 million ounces by the end of 1940, a rise that was 1 3/4 times as much as aggregate world output during the intervening period. The gold stock declined somewhat during the war, but an inflow in 1946-48, arising from the demand for U.S. goods of war-devastated and neutral countries, brought the stock to an all-time high in 1948 (exceeded only in 1949).

The rise in the dollar price of ^{currencies of} gold-bloc countries was at first much greater than that of currencies not linked to gold. From January 1933 to September 1934 the rise was 70 per cent for the currencies of France, Switzerland, Belgium, the Netherlands, and Italy, and less than 50 per cent for the pound sterling. The gold-standard currencies therefore appreciated not only relative to the dollar but also relative to other currencies. The differential appreciation measured the special impact of our gold price-support program on the position of the gold-standard countries. The fact that they lost gold meant that they bore, as it were, a larger part of the effect of the expansion of U.S. exports and contraction of U.S. imports other than gold than other countries did, and thereby cushioned the initial impact on those other countries.

Had nothing else intervened, the gold-standard countries would have had to reduce their internal price levels relative to those of other countries in order to stay on gold, that is, in order to render something like the new structure of exchange rates consistent with no pressure on the balance of payments. In fact, something else did intervene, but it intensified rather than eased the problem of the gold-standard countries. Gold purchases under the fixed price-support program coincided with a flight of capital to the United States from Europe largely induced by political changes: first, the rise to power of Hitler in Germany which led to a large-scale attempt to transfer capital out of Germany; then the increasing fears of war which led to a flight of capital from France, Britain, and other European countries.

If the United States had continued its floating exchange-rate policy of 1933 and had fixed no firm price at which it was willing to buy the world's gold, the capital flight would have produced an appreciation of the U.S. dollar relative to other currencies, which would have discouraged exports

from the U.S. and encouraged imports into the U.S. That outcome would have produced the unfavorable balance of trade required as the physical side of the capital import -- and incidentally, would have worked against one of the domestic objectives of New Deal policy, namely, to raise exports relative to imports as a means of stimulating employment. If, instead, the U.S. and other countries involved had all been on a gold standard of the nineteenth century variety, the attempt to transfer capital to the U.S. would have increased gold reserves in this country, even without a rise in the dollar price of gold, and decreased gold reserves abroad; it would have increased proportionately the money stock in the U.S. and thereby have promoted a rise in domestic prices and income; and it would have decreased the money stock abroad and thereby have promoted a fall in prices and income in foreign countries. These changes would have tended to produce precisely the same shift in relative prices and the same unfavorable balance of trade as the appreciation of the dollar under the hypothetical floating exchange rates would have done.

Since the flight of capital constituted an increased demand for dollars, its effects on exchange rates and on U.S. trade in commodities and services other than gold were in precisely the opposite direction to those of the gold price-support program and tended to offset them. There was simultaneously an increased offer of dollars for gold on the part of the U.S. government and an increased demand on the part of foreigners for dollars to hold. By trading assets held abroad for gold and transferring the gold to the U.S. Treasury, foreigners could acquire dollars and the Treasury could acquire gold without in any way affecting the rest of the U.S. balance of payments. To the extent that such offsetting occurred, the gold program did not affect U.S. trade currents and the relative prices of internationally traded goods

in ways referred to earlier. Since such changes in trade currents and relative prices tended to reduce the amount of gold offered for sale to the United States at its fixed price, the capital inflow meant that this country acquired a larger amount of gold at \$35 an ounce than it otherwise would have. Hence, while the capital inflow and the gold price-support program had opposite effects on U.S. exchange rates and on U.S. trade in commodities and services other than gold, both tended to raise its gold stock. For gold-standard countries that were themselves subject to a capital outflow -- that is, for all the important gold-bloc countries that had remained on gold after 1933 -- the capital inflow reinforced rather than offset the effect of the gold-price-support program. It required an additional reduction in internal price levels beyond that called for by the support program. Exports had to be still larger relative to imports if they were to finance the capital outflow without a continued outflow of gold.

The deflation that would have been required by the combined effect of the U.S. gold price-support program and the capital outflow was more than the gold-bloc countries were willing to undergo, as perhaps the effect of either alone might also have been. Accordingly, in the fall of 1936, France and Switzerland devalued their currencies in conjunction with a tripartite agreement between the United States, France, and Great Britain. The governments of Belgium and the Netherlands, which followed suit, and Switzerland also subscribed to the agreement.

All these countries set up exchange stabilization funds. The Tripartite Agreement of September 25, 1936, provided that stabilization fund holdings of foreign currencies would be used to avoid undesirable fluctuations in exchange rates. Arrangements for mutual currency support were undertaken, based on daily gold settlements at prearranged prices. Each day the authorities of the six countries would cable each other the prices in terms of their

own currencies at which they would sell and buy gold for the next twenty-four hours. Each party would then decide, without risk of exchange losses, the buying and selling rates for the currencies of the other participants. Foreign balances at the end of each day were convertible into gold at the guaranteed price. The agreement was a precursor of the swap arrangements that the industrialized countries perfected during the Bretton Woods period of international monetary arrangements. Under the agreement, the U.S. stabilization fund purchased foreign currencies in New York at rates the foreign funds determined and that day converted these currencies into gold earmarked to its account abroad or released to it from foreign earmarked holdings in the United States. Mainly, however, gold imports into the United States were brought in by foreign monetary authorities or private sellers of gold to the U.S. Treasury, not by the Fund.

In purchasing gold, as in purchasing agricultural or other commodities, the U.S. government can be said to have three sources of funds: tax receipts, borrowing, or money creation. The one difference is that the support program for other commodities (excepting silver) carried with it no authorization to create money, whereas the support program for gold did, thereby automatically providing the financial means for its continuance. Treasury deposits at Federal Reserve Banks could be increased through gold purchases by gold certificate credits equal to the amount of gold purchased times the official price of gold. Except for a minor handling charge ($1/4$ of 1 per cent), this was also in practice the amount the Treasury spent by drawing a check on its deposits in acquiring gold. Gold purchases were usually financed in this way; hence, increases in the gold stockpile produced no automatic budgetary pressure. The link between gold purchases and Treasury authorization to create high-powered money was the main remnant of the historical role of gold, and served to give gold some special monetary significance. The one important occasion

when a different method of finance was used was in 1937, when the Treasury "sterilized" gold by paying for gold with funds raised through security issues.¹

¹During the first nine months of 1937, the Treasury did not use the cash balances it could create on the basis of the gold it bought. Instead, it paid for the gold by borrowing from the public and the banks. What the Treasury took from the public and the banks by the sale of securities offset what it paid to the public and the banks by the purchase of gold. Accordingly, high-powered money did not reflect the growth of the gold stock.

The operation was economically identical with the sterilization actions of the Federal Reserve in the 1920s, when the System sold bonds on the open market to offset the increase in high-powered money that would otherwise have arisen from a gold inflow. The Treasury program became effective at about the same time the Federal Reserve was imposing two increases in reserve requirements on member banks (on March 1 and May 1, 1937; an earlier increase was imposed in August 1936). The sterilization program sharply reinforced the effect of the rise in reserve requirements in producing monetary restrictiveness; the rise in reserve requirements increased the demand for high-powered money; simultaneously the Treasury's action virtually brought to a halt an increase in high-powered money which had been proceeding with only minor interruptions since 1933.

A start toward desterilization was made in September 1937, when the Board of Governors of the Federal Reserve System requested the Treasury to release \$300 million from the inactive gold account. The Treasury released the amount requested by the Federal Reserve, but it continued to sterilize all further gold purchases, which amounted to \$174 million in that month. Hence inactive gold held by the Treasury fell only \$126 million in September 1937.

As of January 1, 1938, the Treasury limited the addition to the inactive gold account in any one quarter to the amount by which total gold purchases exceeded \$100 million, and on April 19, 1938, discontinued the inactive gold account, which then amounted to about \$1.2 billion. In the first half of 1938, accordingly, there was a more rapid increase in high-powered money than in the gold stock. The Treasury printed gold certificates corresponding to some of the inactive gold in the Treasury, deposited the certificates at the Reserve Banks, and drew on the balances it thus established to pay government expenses or to redeem debt. The operation was essentially an open market purchase of securities undertaken at Treasury initiative.

Initially, the shift of inactive gold from Treasury cash to Treasury deposits at the Federal Reserve Banks had no immediate monetary effect. Effective desterilization did not occur until more than a year after formal desterilization. Only after February 1939 did the sum of Treasury cash holdings and deposits at Reserve Banks decline toward the level that had prevailed before the sterilization program.

It is easier to describe the gold policy of the United States during the years 1934-1948 than it is to describe the resulting monetary standard of the United States. It was not a gold standard in the sense that the volume of gold or the maintenance of the nominal value of gold at a fixed price could be said to determine directly or even at several removes the volume of money. It was clearly a fiduciary rather than a commodity standard, but it is not possible to specify briefly who managed its quantity and on what principles. The Federal Reserve System, the Treasury, and still other agencies affected the quantity of money by their actions in accordance with a wide variety of objectives. In principle, the Federal Reserve System had

the power to make the quantity of money anything that it wished, within broad limits, but it seldom stated its objectives in these terms. It sometimes, as when it supported the prices of Government securities from 1942 to 1951, explicitly relinquished its control. And it clearly was not unaffected in its actions by gold flows. So long as the exchange rate between the dollar and other currencies was kept fixed, the behavior of relative stocks of money in various countries was necessarily close to what would be produced by gold standards yielding the same exchange rates, even though the mechanism might be quite different.

7. 1948-1968 -- the Bretton Woods dollar/gold standard system

The international monetary system that was designed at the Bretton Woods Conference in 1944 reflected **professional** views on the defects of the arrangements that had prevailed in the 1930s. Protectionist trade policies, controls on capital movements, exchange controls, and competitive currency depreciations of the pre-World War II period were the cautionary experiences to be avoided by the postwar world. Removal of controls on the free international movement of goods and capital, and the conduct of trade under a system of fixed exchange rates, with adjustment of parities limited to "fundamental" disequilibrium in the balance of payments, accordingly were the goals of the system created by the delegates to the Conference. Exchange rates were to be pegged within narrow margins to the dollar. Countries would buy or sell dollars in the foreign exchange market to keep their currencies from appreciating or depreciating more than one per cent from parity. The United States in turn would undertake to convert dollars into gold or the reverse at a fixed price of \$35 an ounce. The International Monetary Fund, to which each member subscribed 25 per cent of its quota in gold or 10 per cent of its net official reserves of gold and dollars, whichever was smaller, was established by the terms of the Bretton Woods charter. It was expected that

lending facilities of the Fund would supplement the members' gold and foreign exchange reserves to provide them liquidity when in balance of payments deficit on current account.

The establishment of par values for currencies was an important item on the Fund's agenda. Canada, France, the Netherlands, the United Kingdom and the United States declared their par values in December 1946, Germany and Japan in 1953, and Italy, not until 1960. Some of these parities were short-lived. An abortive attempt at convertibility of sterling in 1947 ended in September 1949, when the pound was devalued. The Netherlands thereupon devalued the guilder, and France, which has had separate rates for financial and commercial transactions, unified them, depreciating the franc vis-a-vis sterling.

In private gold markets until 1953, the price of gold was at a premium, but the IMF rule required monetary authorities to refrain from selling gold at premium prices. In March 1954, several months after the premium had been eliminated, reflecting balance of supply and demand, the London gold market reopened. For the rest of the decade, the price of gold in private markets remained at \$35 an ounce.

With the return of many European currencies to convertibility in 1958, the achievement of the Bretton Woods conception of international monetary normalcy seemed only a matter of time. The outflow of dollars in U.S. official aid, military spending, and private investment, and economic recovery in Europe and Japan had enabled foreigners to add to their holdings of dollars and gold. U.S. prices were stable until the middle of the decade of the '60s, and their rate of rise generally lower than in the rest of the world. Money supplies in the rest of the world (except in the U.K.) grew at a

faster rate than in the U.S. perhaps as a result of the U.S. contribution to the buildup of other countries' monetary reserves. The dollar's status as the reserve currency of the international economy seemed impregnable. Commercial banks and private firms could make foreign payments in their convertible currencies without the approval of central banks. Tariff and quota

restrictions on commodity trade among the industrialized countries were eased and foreign trade grew at a rapid rate during the period. International transfers of capital grew, with New York at the center of the flows, and the dollar as the vehicle currency in which the borrowers obtained capital and the investors lent their savings.

The successful operation of the system depended on foreign central banks intervening with their own currencies against the dollar to maintain par values, and the Federal Reserve abstaining from intervening to maintain the dollar exchange rate against other currencies. The U.S. balance of payments accordingly was determined by the exchange parities other countries established to achieve payments surpluses that would add to their dollar reserves.

A portent of the troubled future of the system was that 1960 was the first year in which U.S. gold reserves declined below the level of its total liquid liabilities to all foreign holders of assets denominated in dollars (Table 1).

Until March 1961, the U.S. intervened to maintain the price of gold by selling and buying dollars. Concern over the continuing conversion of dollars into gold led the Treasury to activate the Exchange Stabilization Fund and on March 13, 1961, the Federal Reserve Bank of New York as its agent was authorized to buy or sell foreign currencies in the forward exchange market. It sold forward D-marks to reduce the premium on that currency. On February 13, 1962, the Bank was also authorized to buy or sell foreign currencies on behalf of the Federal Open Market Committee in both spot and forward markets. For this purpose a stock of foreign currencies in addition to those acquired from the Stabilization Fund was needed. The Federal Reserve therefore negotiated a network of swap facilities with the central banks of other countries. The swap provided a specified amount of

Table 1

^{Monetary}
U.S. [^]Gold Stock and Liquid Liabilities to Foreigners
(millions of dollars)

End of Year (1)	Total Monetary Gold ^a Stock (2)	Total Liquid Liabilities to All Foreigners ^c (3)
1954	21,793	12,454
1955	21,753	13,524
1956	22,058	15,291
1957	22,857	15,825
1958	20,582	16,845
1959	19,507	19,428
1960	17,804	{20,994
		{21,027
1961	16,947	{22,853
		{22,936
1962	16,057	24,068
1963	15,596	{26,361
		{26,322
1964	15,471	{28,951
		{29,002
1965	13,806 ^b	29,115
1966	13,235	{29,904
		{29,779
1967	12,065	{33,271
		{33,119
1968	10,892	{33,828
		{33,614
1969	11,859	{41,735
		{41,894
1970	11,072	{43,291
		{43,242
1971	10,206	{64,266
		{64,223
1972	10,487 ^d	78,680
1973	11,652 ^e	87,520 ^f
1974	11,652	119,164 ^f
1975	11,599	126,552 ^f
1976	11,598	151,356 ^f
1977	11,719	192,321 ^g
1978	11,671	
1979	11,172	
1980	11,160	

Notes to Table 1

Source: A. Banking and Monetary Statistics, 1941-1970. Board of Governors of the Federal Reserve System, Washington, D.C., 1976

B. Federal Reserve Bulletin, March 1975, A61, A63; March 1978, A55, A57; June 1978, A56; May 1981, A53, A56.

Col. (2): Source A, p. 899; Source B, A61, A55, A56.

Col. (3): Source A, pp. 932-933; Source B, A63, A57, A56.

^a The stock includes gold sold to the U.S. by the IMF with the right of repurchase, and gold deposited by the IMF to mitigate the impact on the U.S. of foreign purchases for the purpose of making gold subscriptions to the IMF under quota increases.

^b The figure excludes \$259 million gold subscription to the IMF in June 1965 for a U.S. quota increase that became effective Feb. 23, 1966.

^c The total includes small amounts due to the IMF arising from gold transactions, amounts due to official institutions, commercial banks abroad, to other foreigners, and to nonmonetary and regional organizations. Nonliquid liabilities to official institutions included in the source beginning 1962 through 1973 have been deducted. Years for which two entries are shown show differences because of changes in reporting coverage. Figures on the first line are comparable with figures for preceding dates; figures on the second lines are comparable with those for the following dates.

^d Change in par value of dollar on May 8, 1972, increased the value of the total gold stock by \$822 million.

Notes to Table 1 (concluded)

^eChange in par value of dollar on Oct. 18, 1973, increased the value of the gold stock by \$1,165 million. -

^fNonliquid liabilities which are not distinguished in the source may be included. Preliminary figures for 1974 showed nonliquid liabilities equal to \$6,124 million. In 1973, the total for the item was \$4,871 million.

^gThe table giving U.S. liabilities to all foreigners was discontinued after the June 1978 issue of Source B. A new table, Selected Liabilities to Foreign Official Institutions, replaced it. The entries for 1975-1980 are as follows.

1975	82,572
1976	95,634
1977	131,097
1978	162,589
1979	149,481
1980	164,312

Source B: Dec. 1978, A58; May 1981, A56

foreign currency in exchange for an equivalent dollar credit for the foreign central bank, with each party protected against loss due to a change in par values. Invested balances of both parties earned the same rate of interest, foreign balances in special U.S. Treasury certificates, Federal Reserve balances in interest-earning deposits abroad. Balances were available for payments to other central banks or for foreign exchange market transactions. The swap was a credit line, for 3- or 6-month periods, renewable at maturity. By drawing on the credit, gross reserves of both parties were increased. The U.S. normally used the proceeds of a swap to absorb dollar holdings, in effect, substituting forward dollars for spot dollars held by the partner, to reduce the threat of their conversion into gold.

Repayment of short-term swap credits meant a corresponding decline in gross reserves. For the U.S. this could entail a loss of gold. To deter this eventually, the U.S. began issuing nonmarketable bonds, with maturities of 15 months to two years, denominated in the holder's currency, to fund outstanding swap debt. The bonds were, however, convertible into Treasury bills on demand.

A further indication of U.S. concern about gold was the prohibition after mid-1961 on holding of gold outside the U.S. by U.S. firms and households, and on March 3, 1965, the abolition of gold reserve requirements against Federal Reserve deposits.

A focus of pressure on the U.S. dollar was the London gold market. In March 1960, the price rose above \$35 an ounce, as European central banks and private investors bought gold for dollars. The Bank of England sold gold to stabilize the price, but the U.S. Treasury initially was not willing to restore the Bank's holdings. Hence, when a rise in the price of gold occurred in October, the Bank did not intervene. On October 27, with the price reaching \$40 an ounce, the Treasury agreed to sell gold to the Bank,

reserving for the Bank the decision on intervention in the market. European central banks soon after agreed to refrain from buying gold in the London market for monetary purposes whenever the price rose above \$35.20, the U.S. price plus shipping costs. When the price fell below that level in 1961, the central banks returned to the market. However, in October 1961, when the price again was reacting to heightened demand, an agreement to create a "gold pool" was reached, on U.S. initiative. The U.S. contributed \$135 million to the pool and seven European governments an equal amount to be used to replenish gold sold by the Bank of England as manager of the market. The members of the pool subsequently agreed not to buy gold individually on the market, but to give the Bank of England the right to buy on their joint account when gold supply exceeded demand, the amount purchased to be distributed in proportion to each country's contribution to the pool. The pool functioned until the end of 1967, when a surge of buying led to the suspension of the arrangement in March 1968.

A key development for the international monetary system that was not perceived as such at the time was the acceleration of the U.S. monetary growth rate and the subsequent acceleration of the U.S. inflation rate in the final years of this subperiod. What was perceived was the cumulative growth of deficits in the U.S. balance of payments. Assets denominated in dollars grew in excess of the demand for them by the rest of the world. Their conversion into gold, by shrinking U.S. gold reserves, threatened one of the basic underpinnings of the Bretton Woods structure, namely, convertibility of dollars into gold.

The Bretton Woods system might have been able to survive an end of gold convertibility. It could not survive inflationary monetary policy in the center country that characterized the decade from the mid-'60s on.

Crisis management by the IMF and the central banks of the leading industrialized countries became the hallmark of the international monetary system during the heyday of Bretton Woods. The chief currency under pressure, apart from the dollar, was sterling. Persistent or recurring U.K. balance of payments deficits impaired the credibility of sterling's external value, already insecure by reason of the size of sterling balances held worldwide relative to U.K. gold and foreign exchange reserves. Private agents displayed lack of confidence in the dollar and sterling by shifting to currencies whose external values were regarded as stable or likely to appreciate (during this period, the D-mark and guilder). Repeated rescue operations to support the exchange value of sterling were overwhelmed in November 1967. Sterling, however, was a sideshow. The main act was the dollar's performance.

The gold market was the market in which participants expressed lack of confidence in the dollar-based international monetary system. After the devaluation of sterling in November 1967, the vulnerability of the dollar took center stage. In the winter of 1967-68, a surge of demand for gold threatened both the London Gold Pool and the \$10 billion statutory backing for Federal Reserve notes. On March 12, 1968, the U.S. gold reserve requirement was abolished. Ostensibly, the gold stock was then available for conversion of dollars held by foreign central banks. On March 17, however, the London gold market was closed to avoid further U.S. gold losses. The contributors to the gold pool announced that they would no longer supply gold to the London or any other gold market or buy gold from the market. Official transactions between central banks were to be conducted at the unchanged official price of \$35 an ounce, but the gold price for private transactions was to be determined in the market. Central banks were still

free de jure to buy U.S. Treasury gold for dollars but in fact refrained from doing so. Germany had explicitly forsworn converting its dollar holdings into gold in May 1967.

One measure the U.S. authorities might have taken was a rise in the dollar price of gold, thus increasing the value of the stock and the flow of reserve assets. If other countries did not follow suit by adopting a proportional increase in the price of gold in their currencies, the U.S. in this way might have obtained a devaluation of the dollar that the Bretton Woods system otherwise ruled out. Had the price of gold risen, the gold demands of other countries might have been satisfied without the rundown in U.S. reserve assets. Some countries might also have revalued because of the inflationary consequences of their payments surplus, given the gold-based increase in their asset holdings.

The U.S., however, resolutely opposed a change in the monetary price of gold. Given the fixed price of gold when national price levels were rising, gold became an undervalued asset with a resulting gold shortage.

The measures adopted to avoid exchange rate changes were intended to limit international transmission of price change. Surplus countries tried to avoid price increases; deficit countries, price declines, both as external consequences of their balance of payments positions. Intermittently, depending on cyclical conditions, countries in both categories took steps to right payments imbalance.

Since palliatives to improve the balance of payments proved ineffective, deficits had to be financed either by drawing down reserves or seeking external credit or borrowing facilities, while surpluses obviously increased reserve accumulations. During the heyday of the Bretton Woods system, despite the growth of dollar assets, the adequacy of international liquidity,

in the sense of the quantity of international monetary reserves, was widely debated. Discussions during this period growing out of concern for the supply of reserves led to the creation of SDR's by the IMF, but that development belongs in the account of the breakdown of the system. Until 1968, international reserves were limited to gold, convertible foreign exchange, and reserve positions in the IMF.

Contrary to the design of Bretton Woods, financing of payments imbalances for the most part was arranged through credits governments extended on a bilateral basis and through international borrowing and lending activities of commercial banks. Thus to restore depleted reserves of countries with persistent deficits, facilities for borrowing were created in addition to drawings from the IMF.

Official dollar reserves of the surplus countries were augmented at times by actions those countries took in the Eurodollar market. Dollars acquired by their central banks and deposited in the Eurodollar market either directly or through the Bank for International Settlements would usually be relent to private borrowers who could resell the dollars to the central banks.

In sum, world reserves grew rapidly during the period.

8. 1968-1973 -- the breakdown of the Bretton Woods system

The devaluation of sterling in November 1967 was not regarded as the prelude to changes in the par values of other currencies, the devaluation of the dollar in terms of gold, the realignment of exchange rate relationships among the major currencies, and the substitution of a short-lived regime of central rates for the par value system -- all of which took place between November 1967 and December 1971. Instead, it was hoped that balance in the U.S. and U.K. external payments was finally on the point of achievement, and that the creation of a special drawing rights facility in the IMF would replace reserve assets that dollar and sterling deficits had provided.

The hope was belied. The pattern of deficits and surpluses persisted and worsened in 1970 and 1971. The U.S. current account surplus dwindled and the U.S. capital account deficit grew dramatically, producing current account surpluses and capital inflows in other countries. The activation of SDRs in 1970-72 provided additions to already massive acquisitions of dollar reserve assets.

As in the heyday of the Bretton Woods system, disbelief of market participants in the pegged external values of currencies precipitated turbulence in the foreign exchange market.

The persistent outflow of funds from the U.S. overwhelmed foreign exchange markets in the first few days of May, 1971. On May 5, seven European countries closed their foreign exchange markets, and five others on several continents withdrew their support for the dollar and suspended dealings in D-marks, guilders, and Swiss francs. On May 9, both Germany and the Netherlands announced that their currencies would float, since they could not maintain exchange rates within the established margins.

In March 1971, before the panic of the foreign exchange market, there was a request from several European countries for conversion of officially held dollars into gold to enable them to pay for an increase in their IMF quotas. The payout reduced the U.S. gold stock to the lowest level since 1936. The dollar outflow meanwhile accelerated, leading, as noted, to the floating of European currencies. The imbalance between U.S. gold reserves and outstanding dollar liabilities occasioned the changes the U.S. introduced on August 15, 1971, to achieve a dollar devaluation. Chief among them (besides a price and wage freeze, tax increases and federal government spending cuts) was a 10 per cent import surcharge on 50 per cent of total U.S. imports. The convertibility of the dollar into gold

was formally suspended, as was also the swap network through which dollars could be exchanged with central banks for other currencies. The effect was to oblige other countries to hold dollars or to trade them for a price determined in the market and so revaluing their currencies. Foreign exchange markets abroad, except in Japan, shut down. The Japanese initial attempt to maintain

the pegged rate of the yen compelled them to purchase \$4 billion in the two weeks after August 15. The yen was then freed to float upward; other currencies floated when exchange markets were reopened on August 23. France introduced a dual exchange market, with trade and government exchange dealings based on the par value, financial exchange dealings at a floating rate. Restoration of a repegged system of exchange rates, however, remained the goal of the U.S. and its partners.

After much negotiation, a readjustment of currency parities was arranged at a meeting at the Smithsonian Institution in Washington on December 17-18, 1971. In return the U.S. agreed to withdraw the import surcharge. Currencies were revalued by percentages ranging from 7 1/2 (Italy) to 16.9 per cent (Japan), with the proviso that 2 1/4 per cent margins of fluctuations (replacing the former 1 per cent margin) above and below the new so-called "central" exchange rates were permissible. The Canadian dollar continued to float. The Smithsonian agreement also specified that the official dollar price of gold would henceforth be \$38, a concession by the U.S. for appearance sake only, since the dollar remained inconvertible. The new price of gold implied a depreciation of the gold-value of the dollar rather than an appreciation of the dollar value of other currencies.

The central rates established at the Smithsonian meeting crumbled during the nine months following the floating of sterling ^{in June 1972}. Once again, the disbelief of market participants in those rates was revealed in the gold and foreign exchange markets. The London free market price of gold rose with few reversals. Money growth and inflation rates continued to rise in the U.S. and both the balance of trade and the U.S. balance of payments deficit soared, with a corresponding surge in dollar holdings of the industrialized European countries and Japan. Capital controls were imposed in 1972 by ^{the} Netherlands and Japan before sterling was floated and Germany followed suit afterwards.

On February 10, 1973, Japan closed its foreign exchange market and suspended support of the dollar. New central values were set in a hurried round of negotiations, although the lira, yen, Canadian dollar, the U.K. and Irish pounds, and the Swiss franc all floated. Again, the official price of gold was raised (this time to \$42.22), leaving unchanged the gold value of other currencies. The new central rates did not staunch the flow of dollars abroad, and a further crisis erupted in March 1973. This time the major industrial countries discontinued pegging their exchange rates to the dollar. The EEC countries in the snake, which had been activated in April 1972, plus Sweden and Norway agreed to a joint float, with Germany revaluing by 3 per cent (in terms of SDRs) in relation to the other members. Canada, Japan and Switzerland floated individually, as did a handful of other countries. Though a large group of nonindustrialized countries pegged to the dollar, the dollar currency area worldwide contracted; smaller groups of countries pegged to the French franc or to the pound.

9. 1973-1981 -- the United States on an inconvertible paper standard

When pegged rates were abandoned in March 1973, it was initially assumed that floating was a temporary expedient to be succeeded by a reformed par value system. The U.S. took the lead in opposing the return to such a system. The dispersion of inflation rates among the industrialized countries and the higher variability of rates of inflation since the late 1960s enforced more frequent changes of exchange rates. Under the earlier system, changes in par values were delayed until foreign exchange market crises were provoked. The lesson since the shift in March 1973 was that floating provided more flexibility. The U.S. view prevailed. In place of the par value system ordained in the Articles of the Bretton Woods charter, an amendment in April 1976 gave member banks the option to float for an indefinite period or to peg exchange rates, at their discretion. The IMF accepted a fait accompli

although, to placate opponents of the float, another provision stipulated that at a future unspecified date reestablishment of a system of fixed but adjustable rates was possible with an 85 per cent affirmative vote by the members, thus giving the U.S. an effective veto.

It was widely believed that the stock of reserve assets would contract in a world of floating exchange rates compared to a world of pegged rates. In fact, official holdings of reserve assets have increased in every year since the float. From 1950 to 1969, on average, world reserves including gold rose by less than 3 per cent per year, the foreign exchange component by 5 per cent per year. From the end of 1969 to the end of 1972, the average annual rate of increase of foreign currency reserves was 43 per cent. Since 1973, the average annual rate of increase has been 15 per cent. The main source of growth of foreign currency reserves since 1973, as in earlier years, has been in the form of dollars. The demand for reserves has increased even under floating rates because the system is substantially managed.

A significant change in the distribution of foreign exchange reserves has occurred since October 1973 as a result of the rise in the price of oil. Total foreign exchange reserves of industrial oil-importing countries have remained roughly stable, but the major oil-exporting countries, which in 1970 held only about 5 per cent of total world foreign exchange reserves, by the end of the decade held about one-quarter of the total, the value of which had tripled since 1970.

The dollar has continued to serve as the main reserve currency, accounting for about 80 per cent of the world's official foreign exchange reserves. As under pegged rates, the U.S. continues to pay for its imports in dollars, which foreigners add to their reserve accumulations, and use to settle their deficits with other countries. The dollar also remains the common official intervention currency in foreign exchange markets, and serves as a common

vehicle currency in the interbank market for foreign exchange. In effect, the world has adopted an inconvertible dollar standard.

One change in the international reserve profile was the creation on March 13, 1979, of the European Monetary System -- replacing the "snake", the European joint float -- by nine European countries (Belgium, Denmark, France, Germany, Ireland, Italy, Luxemburg, and the Netherlands; the U.K. is a member but does not participate in intervention arrangements). The center of the system is the European Currency Unit (a basket of all nine currencies), issued by the European Monetary Cooperation Fund in an amount equal to a deposit of 20 per cent of gold and dollar reserves of participating countries, to be used for settlement of intervention debts. ECUs, now included in foreign exchange holdings of the participating countries, do not increase world monetary reserves. The ECUs issued value gold on the basis of either the average market price of the six preceding months or the average market price on the day before issue, whichever was lower.

With gold valued at market price, world gold reserves at the end of 1979 were larger than foreign exchange reserves. The U.S., however, values its own gold assets at the official price of \$42.22 per ounce, despite the IMF's abolition of that price.

After the float, the U.S. took the position that gold should be demonetized. An opposing view was promoted principally by France. Developments reflect the extent to which one or the other dominated international decisions. At issue was the use of gold in official transactions at the free market price, and the substitution of gold for the dollar in inter-central bank settlements at a fixed but higher official price.

The ban on official transactions in the gold market that had been adopted in March 1968 was terminated in November 1973, but the official price of \$42.22 posted in February 1973 was so far below the private market price that

central banks were unwilling to buy and sell gold among themselves at the official price. The central banks were equally reluctant to sell gold on the private market in view of the possible depressive effect of sales on the market price or in anticipation of the opportunity to sell in the future at a higher price. In December 1973, the IMF terminated a decision made four years earlier to refrain from purchasing South African gold for the Fund.

In June 1974, countries in the Group of Ten agreed that an inter-central bank loan could be collateralized by gold at a price other than the official gold price, and in September, Italy obtained a loan from Germany on the pledge of Italian gold valued at a mutually agreed price. In December, the U.S. and France agreed that central banks were at liberty in valuing gold holdings for balance sheet purposes to use the market price, which the Bank of France proceeded to do.

Early in 1975, the countries in the Group of Ten and Switzerland agreed for a two-year period not to increase the sum of their and the IMF's gold holdings and to contribute no support to the price of gold in the free market. In August 1975 agreement was reached by an IMF committee that

the official price of gold would be abolished

members would not be obliged to use gold in transactions with the Fund

a part of the Fund's gold holdings would be sold at auction for the benefit of developing countries and another part would be returned to member countries in proportion to their quotas.

The first public auction of part of the Fund's gold holdings was held in June 1976. A four-year sales program was scheduled. In the first two years, 16 auctions were held approximately every six weeks, with aggregate sales of 12.5 million ounces. The balance of 12.5 million ounces was sold mainly in

24 auction lots through May 1980, and a small amount in noncompetitive sales. Restitution of 25 million ounces to member countries over a four-year period was completed in December 1979/January 1980.

The U.S. repealed the prohibition against gold holding by U.S. residents as of January 1, 1975, and empowered the Treasury to offset any increase in market price as a result of this increment to private demand by offering gold at auction. The first auctions were held in January and June 1975, when the Treasury disposed of 1.3 million ounces. No auctions were held in 1976 and 1977. They were resumed in 1978 and 1979, when the Treasury sold 4.0 and 11.8 million ounces, respectively, motivated as much by the desire to reduce the U.S. balance of payments deficit on current account as by the belief "that neither gold nor any other commodity provides a suitable base for monetary arrangements."

The gold sales constituted open market operations approximating \$0.8 billion in 1978 and \$3.6 billion in 1979. Gold sales by the Treasury reduced the public's deposits and so bank reserves. The sales thus initially provided a partial offset to ^{Federal Reserve} open market purchases of government securities that increased the public's deposits and bank reserves. It was a partial offset only because the System's portfolio of government securities showed a net increase of \$7.7 billion in 1978 and of \$6.9 billion in 1979. It was an offset initially only depending on the Treasury's use of the proceeds of the gold sales. To the extent that the Treasury used the proceeds to retire gold certificate credits and thereby reduced its deposits at the Federal Reserve, the monetary effects of the gold sales were contractionary. However, to the extent that it disbursed the remainder of the funds it acquired, the Treasury's action restored the public's deposits and bank reserves, so the contractionary effect on the money supply of the gold sales was limited.

Since 1979, the Treasury has sold no gold bullion. In July 1980, however, it began the sale of half-ounce and one-ounce gold medallions, in accordance with P.L. 95-630, November 10, 1979. The legislation provided that not less than 1 million troy ounces of fine gold be struck into medallions and sold to the public over a five-year period at a price covering all costs. In 1981, U.S. Government gold inventories amounted to 264.2 million ounces. The Reagan Administration has announced that its position on the proper role of gold in the international monetary system will not be formulated until the Congressionally mandated gold commission issues its report.

Direct official intervention to maintain the open market price of currencies within narrow limits has not lessened under floating rates compared with the pegged parity system. Intervention in some countries is assigned to nationalized industries that borrow foreign currency in order to buy their own currency on the foreign exchange market, in Italy and the U.K., with government provision of insurance against foreign exchange loss, in France with no such provision. In Japan and sometimes in France, dollar deposits held by the government at commercial banks are used for intervention.

Italian and French commercial banks intervene at the government's behest. Central bank intervention may thus be conducted by a variety of institutions at the direction of the monetary authorities.

The pattern of intervention since the float by the U.S. and its trading partners is to buy dollars both when the dollar depreciates and when foreign currencies appreciate. Countries with weak currencies sell dollars. When the supply of dollars increases in foreign exchange markets, managed floaters may buy up some of the additional dollars or may permit the price of dollars to fall in terms of their own currencies. Buying up dollars has negative consequences for domestic monetary control; permitting the price of dollars to rise has negative consequences for oil-importing countries.

There was apparently little intervention during the four months following the float in February 1973. The progressive decline in the weighted exchange rate of the dollar between February and July 1973 vis-a-vis a group of major currencies led to a decision by the governors of the central banks of the Group of Ten to support the dollar. In July 1973, the Federal Reserve Bank of New York began to intervene in the New York spot exchange market to maintain "orderly market conditions." Intervention was effected with the Federal Reserve's own small holdings of foreign currency or by activating the much larger total of foreign currency loans through swap agreements.

Concerted exchange intervention was agreed to by the Federal Reserve, the Bundesbank, and the Swiss National Bank in May 1974, after several months of dollar depreciation. The dollar strengthened until September when renewed weakness developed through March 1975. The explanation given by the Board of Governors was:

Contributing to this decline in the dollar's exchange value was the asymmetry in intervention policies between countries with weaker currencies and those with strengthening currencies. Intervention sales of dollars by countries supporting weaker currencies exceeded purchases of dollars by countries resisting the appreciation of their currencies. The net effect of these operations was to add to the market supply of dollars, depressing the dollar's average exchange rate.

Explicit approval of management of floating exchange rates was expressed by the IMF in six guidelines it issued in June 1974. Acceptance of intervention as desirable policy was reiterated in a November 1975 meeting that preceded the revision of the IMF's Articles of Agreement in 1976.

Since the dollar showed little weakness in 1976, the Federal Reserve intervened to sell dollars on behalf of other currencies. In January the Italian lira came under pressure. The decline in its exchange value weakened the French franc within the European currency "snake," leading to substantial French intervention. Massive intervention to support sterling which declined from \$2.00 in March to \$1.77 in mid-September was provided by a \$5.3 billion stand-by credit arranged by the Group of Ten countries, Switzerland, and The Bank for International Settlements. Sterling's further decline later in the year led to an IMF drawing, further borrowing, and a facility to reduce official sterling balances. Interventions were also engaged in to moderate appreciations of the D-mark, the Swiss franc, and the yen.

Renewed weakness of the dollar in early 1977 was masked by large intervention purchases of dollars by the Bank of England and the Bank of Italy undertaken to limit the appreciation of their currencies and to rebuild their reserve positions. The Federal Reserve intervened only occasionally during the first three quarters. When the Bank of England ended its large purchases of dollars, the dollar dropped sharply. The Federal Reserve increased the scale of intervention, joined by the U.S. Treasury, which negotiated a new swap facility between the Exchange Stabilization Fund and the Bundesbank.

The decline in the weighted average exchange value of the dollar accelerated in 1978 through the end of October. An anti-inflation program announced on October 24 (contractionary fiscal and monetary policy, voluntary wage and price standards, and a reduction in the cost of regulatory actions) had no effect on the exchange market. On November 1, the Administration and the Federal Reserve took further action. A \$30 billion intervention package was arranged with Germany, Japan, and Switzerland. The Federal Reserve raised the discount rate from 8 1/2 to 9 1/2 per cent, and imposed a 2 per cent supplementary reserve requirement on large time deposits. During the last two months of 1978, U.S. support operations for the dollar totaled \$6.7 billion, including sales of Treasury securities denominated in foreign currencies, accompanied by significant purchases of dollars by Germany, Japan, and Switzerland. By June 1979, the dollar had risen from its 1978 trade-weighted low by about 10 per cent. From that month on, the dollar weakened. The Federal Reserve raised the discount rate to 11 per cent in September, and the U.S. sold the equivalent of \$4.2 billion in D-marks between August and early September.

On October 6, 1979, the Federal Reserve announced a wide-ranging set of measures to tighten monetary control (a shift in operating procedures from control of the Federal Funds rate to control of bank reserves; an increase in the discount rate to 12 per cent; a marginal reserve requirement on banks' managed liabilities), and the dollar began to appreciate. After April 1980, however, the dollar began to decline, a movement that was reversed in September. From February 1980 on, the U.S. intervened frequently, operating on both sides of the market. When the dollar was in demand, it acquired foreign currencies in the market and from correspondents to repay earlier debt and to build up balances. The Federal Reserve was a buyer from February to March. From late March to early April and beyond, it sold D-marks, Swiss

francs, and French francs. By the end of July, the U.S. was again accumulating currencies. Both the Treasury and the Federal Reserve Trading Desk purchased D-marks and lesser amounts of Swiss francs and French francs on days when the dollar was strong, selling on days when the dollar weakened. By the end of 1980, the U.S. was in currency markets on a day-to-day basis.

The Reagan Administration has announced its intention to reduce the scale of intervention, to discontinue the policy of building up currency reserves, and to cut back its short-term swap arrangements with foreign countries. The reason for the shift in policy is the administration's view that intervention is both costly and ineffectual, and that the way to restore exchange rate stability is by the creation of more stable domestic economic conditions. European central banks do not share the Reagan Administration's views and continue to intervene to affect the exchange value of their currencies. This raises a question whether the degree of control U.S. authorities can exercise over the effective exchange rate for the dollar under a floating rate system is any greater than under a pegged exchange rate system.

The Bretton Woods System broke down essentially because non-reserve currency countries were unwilling as a group to adopt the policy of inflationary monetary growth the reserve-currency country was pursuing. To achieve independent monetary policy, the only workable exchange rate system was floating. Flexible exchange rates permit a country to choose its desired long-run trend rate of monetary growth and of inflation, independent of other countries' choices.

Even when autonomy exists, monetary policy may perform badly. It is in this context that the movement in a number of countries during the 1970s toward the improvement of monetary control must be viewed.

Central banks have typically used short-term interest rates as the instrument to control monetary growth. Under non-inflationary conditions, this conduct produced a pro-cyclical movement in monetary growth. Under the gathering inflationary conditions since the mid-1960s, the inflation premium that became imbedded in interest rates made the instrument unreliable as an indicator of restriction or ease. Reliance on it contributed to a secular rise in the rate of monetary growth. Central banks in a number of countries, some more willingly than others, in the 1970s adopted targets for monetary growth without necessarily abandoning their desire to hold down interest rates or exchange rates, so that successful targeting has not invariably been the result. If it was hoped that public announcement of targets for monetary growth would itself reduce expectations of inflation, the failure time after time to achieve the targets has diluted any possible effect on the formation of expectations.

The period since October 6, 1979, when the Federal Reserve announced a new procedure to improve control of monetary aggregates, is probably too brief to pronounce judgment on the likelihood that the System will achieve its objectives of steady deceleration in monetary growth. The inconvertible paper monetary standard operated at the discretion of monetary authorities is on trial.

What is the current role of gold? IMF members no longer define the exchange value of their currency in terms of gold and trade in and account for gold at any price consistent with their domestic laws. Gold is no longer the numeraire of the international monetary system. The introduction of SDRs (valued in terms of a basket of national currencies, as of July 1974), rather than in terms of gold, was intended to replace both the dollar and gold in the international monetary system.

The market price of gold has increased more rapidly since the float than the prices of most other durable assets. The future role of gold in the international monetary system as a reserve asset and as a determinant of the world's price level may depend on the performance of the dollar. If the performance of the dollar improves, gold may be dethroned even if its use as a reserve asset continues. Failure of the dollar to perform in

a stable fashion in the future leaves open the possibility of a restoration of a significant role for gold.

10. Summary

The United States adopted a de facto gold standard in 1834. Thereafter, it adhered to some form of a gold standard with only two extended interruptions, once for 17 years in the 19th century, and again in this century, for 13 years, if one dates the interruption from 1968, when the two-tier London gold market was created; for 10 years, if one dates it from 1971, when convertibility of the dollar, even for official transactions, was formally suspended; for 8 years, if one dates it from 1973, when floating exchange rates were formally adopted by the United States and the Western industrial countries. The political objective of returning to the gold standard was achieved in the 19th century case, despite opposition from silver and paper money advocates. Whether that political objective is currently achievable cannot be determined from a retrospective view.

In addition to the two extended interruptions in U.S. adherence to a gold standard, temporary suspension of a few weeks to a year's duration occurred in 1837, 1839, 1857, 1893, 1907, 1917-19, and 1933. In all cases but the latter two, the years in question climaxed periods of economic expansion in the United States, fostered by external as well as internal factors. The pace of the expansions raised U.S. prices and incomes above those prevailing in the rest of the gold standard world. To bring the U.S. price and income structure into alignment with that of its trading partners enforced reductions in the U.S. money stock, usually resulting from a decline in U.S. gold reserves and in capital imports from abroad. Prices, output, and employment subsequently declined, accompanied by bankruptcies of firms and bank failures. Suspension of specie payments in the years under review

was a means of mitigating the costs of deflationary adjustment that maintaining par values of the exchange rate imposed. The devaluation implicit in suspension gave the economy a breathing spell. With recovery, the former par value of the exchange rate was restored.

No special comment is needed on the World War I restriction of interconvertibility between paper money and gold and the free international movement of gold. The situation in 1933, however, does require comment. That year was in no respect similar to the earlier examples of temporary devaluations. 1933 was a year of a business cycle trough after four years of deflation. The deliberate reduction in the gold content of the dollar was arranged to achieve a price rise of nongold commodities, and the devaluation was never reversed. Moreover, the fixed exchange rate gold standard to which the United States returned in 1934 was the same in name only to the pre-1933 gold standard.

Before 1914, gold flows in and out of the United States determined the expansion or contraction of the economy. Between 1919 and 1933, large outflows of gold occasioned contractionary actions by the monetary authorities; small outflows and inflows of gold, whether large or small, were sterilized. After 1934, both inflows and outflows were not permitted to determine monetary growth and the performance of the economy. When the gold reserve ratios applicable to Federal Reserve deposits and notes were close to the minimum legal requirement, the minimum was lowered and eventually abolished. Gold became a symbol rather than an effective constraint on the operation of the monetary authorities.

Figures 1-2 summarize the evidence on the performance of the economy; Figures 3-4, evidence on the purchasing power of gold, whether the gold standard was suspended or in effect.

Trend movements in prices are the most striking feature of Figure 1. From 1834 to 1861, a mild downward trend prevailed, with pronounced cyclical upswings and downswings around the trend. The greenback period from 1862 to 1878 shows the sharp wartime price rise to 1865 followed by a decline of equal magnitude spread over the years to the close of the period. That decline persisted during the gold standard period to 1896, reflecting the disparity between the rate of growth of the monetary gold stock and the enlarged world demand. The reversal of the downward trend from 1896 to 1914 reflects the dramatic increase in world gold output during that period. World War I, like the Civil War period, shows a steep price increase to 1920, followed by the steep price decline from 1920 to 1921, rough stability during the 1920s, and then the great deflation of 1929-33 that restored the wholesale price series to its pre-World War I level, the implicit price deflator to a somewhat higher point than the pre-World War I level. The contraction of 1937-38 is apparent in the post-1933 upswing which continues into and beyond World War II. The wholesale price series shows rough stability in the early 1960s, whereas the implicit price deflator continues an upward movement. Both series accelerate after the mid-1960s.

Figure 2 plots the deviations of real per capita output from its long-run trend. The trend has been strongly positive from 1870 to 1980, as might be expected. There was substantial variance about the trend before 1914 but far smaller in magnitude than from 1914-47, reflecting the sharp swings in the three interwar deep depressions, 1919-21, 1929-33, 1937-38, as well as the wartime movements. However, the pre-World War I variance was marginally greater than the variance of the deviations from trend post-1948. A comparison of the standard deviations of year-to-year percentage change in real per capita income also shows little difference

between the pre-World War I gold standard experience and post-World War II experience: 5.8 per cent vs. 5.5 per cent. Unemployment was on the average lower in the pre-1914 period than in the post-World War I period; 6.8 per cent vs. 7.5 per cent. But again, excluding the interwar years, unemployment 1946-80 averaged 4.8 per cent, reflecting the government's commitment to maintaining employment.

Figure 3 compares the purchasing power of gold, derived in index form from the quotient of the price of gold divided by the wholesale price index, compared with the U.S. monetary gold stock. Under the gold standard, a rise in the purchasing power of gold ultimately increased the growth of the U.S. monetary gold stock by raising the rate of world gold output, and inducing a shift from nonmonetary to monetary use of gold. Movements in the purchasing power of gold thus preceded long-term movements in the monetary gold stock. This relationship underlay the reversion of the price level towards stability under the gold standard. Price increases or decreases tended to be reversed after a run of years. Persistent inflation of post-World War II experience, without a force to reverse the trend, could not have occurred under a fully functioning gold standard. The absence of this positive association after World War II between the purchasing power of gold and long-term movements in the monetary gold stock reflects the loosening of the link between the money supply and the gold stock.

Over shorter periods, the relationship under the gold standard was in the opposite direction. Changes in the monetary gold stock, by influencing changes in the money supply, produced a negative association between the purchasing power of gold and the gold stock. Thus an increase in the gold stock would lead to an increase in the price level and, for a given nominal price of gold, lower the purchasing power of gold. The negative association

may be observed during the gold standard period, changes in the monetary gold stock leading short-term movements in the purchasing power of gold.

Figure 4 compares the exchange value of money, computed as the reciprocal of the wholesale price index, with the purchasing power of gold. The two series are closely related until 1968, when the two-tier market for gold was introduced. The direct relationship until 1968 reflected the existence of a fixed nominal price of gold. The inverse relationship thereafter reflects the increase in private demand for gold as a hedge against inflation and political instability, once private transactions were determined in the free market.

To conclude: The gold standard provided long-term but not short-term price predictability. Long-term inflation or deflation under the pre-World War I gold standard would predictably be reversed as gold output was discouraged or encouraged by decreases or increases in its purchasing power. Thus the price level tended to revert toward a long-run stable value under the gold standard, providing a degree of predictability with respect to the value of money. Subsequent to World War I, the discipline of the gold standard came to be regarded as an impediment to the management of the economy to achieve the objectives of growth and high employment. The deep depressions of the interwar years were the measure by which the economy under a gold constraint was judged to be a failure. The loosening of the link to gold after World War I and its abandonment fifty years later reduced long-term price predictability. Belief in long-term price stability eroded as public perception of the absence of a long-run constraint on monetary growth took hold. Although price stability was generally included among the goals of the post-World War II era, in fact stability of employment took precedence. In the event, by 1981, neither goal was in sight.

Figure 4
The Exchange Value of Money (1972=100) and
the Purchasing Power of Gold (1972=100)



To: Members of the Gold Commission
From: Anna J. Schwartz *ATS*
Subject: Gold Output
Date: September 10, 1981

Gold is a commodity. Like any other commodity, it will be produced only if the price at which it can be sold will exceed the costs of production, including the return on capital investment, wage costs, and prices of other inputs. Until 1968, the world gold trade was essentially controlled by the central banks of the leading industrial countries. They were the source of gold at fixed prices for industrial users. That changed when the private gold bullion market was established in 1968 as the so-called second tier to the official market. Since 1971, the central banks have virtually withdrawn from the world gold market. There is now only a private market in which producers, holders, and users participate. New gold output now moves through the private gold market directly to industrial buyers or nongovernment holders.

In this market, the price of gold fluctuates, like the prices of other world-traded commodities, to balance supply and demand. In the short run, the price may be volatile. In the long run, the price must be high enough to yield a return to producers that is competitive with other uses of their capital. Similarly, no commercial user will buy gold unless its price is competitive with that of substitutes and the product in which it is embedded can be sold at a profit. Investors will choose to hold gold only if it will

yield a return measured in purchasing power that is equal if not greater than the expected real return on other investment opportunities.

This memorandum concentrates on the supply side of the gold market; a subsequent memorandum will deal with the demand side.

Gold was mined in ancient times, but the earliest quantitative estimates available of gold output date from the discovery of America. Between 1493 and 1980, the estimated total of gold mined is 2.8 billion ounces, about two-thirds of which was mined in the past 50 years.

Between 1493 and 1848, the year of the California gold discoveries, total gold mined is estimated at less than 150 million ounces, of which the United States produced less than 2 million ounces. Most of the gold produced by that date was held by individuals as jewelry or coins, not in government monetary reserves. The world monetary gold stock in 1848 was about 50 million ounces.

From 1850 to 1933, total gold mined is estimated at 900 million ounces, of which the United States produced one-third. Most of this output was coined, 350 million ounces by Great Britain, 220 million ounces by the United States, 150 million ounces by the rest of the world, the total not necessarily in circulation. By 1933 the world monetary gold stock amounted to 580 million ounces, having increased at a considerably faster rate than total gold mined.

Except in the decades of the 1870s, 1880s, and 1920s, until 1933 the official price of gold was generally at a premium over production costs, so encouraging an expansion of gold output and discouraging commercial use. The increase in the official price of gold in 1934 accounted for the huge rise in gold output thereafter until the 1960s, when the decline in the real price of gold eroded the incentive to increase output. The world monetary gold stock peaked at about 1.2 billion ounces in the 1960s. Industrial demand for gold, which had been negligible until the 1950s, then rose progressively as the real price declined. By the late 1960s, industrial demand equaled total gold output.

World gold production peaked in 1970. Since then it has been declining in response to the earlier decline in the real price of gold and the depletion of existing reserves. The world monetary gold stock fell to about 900 million ounces in 1980 as monetary authorities reduced official reserves. The free

market price of gold on an annual basis has risen fifteen-fold since 1970, with wider short-term movements, reflecting underlying supply and demand conditions including speculative demands for gold as a hedge against inflation and political uncertainty.

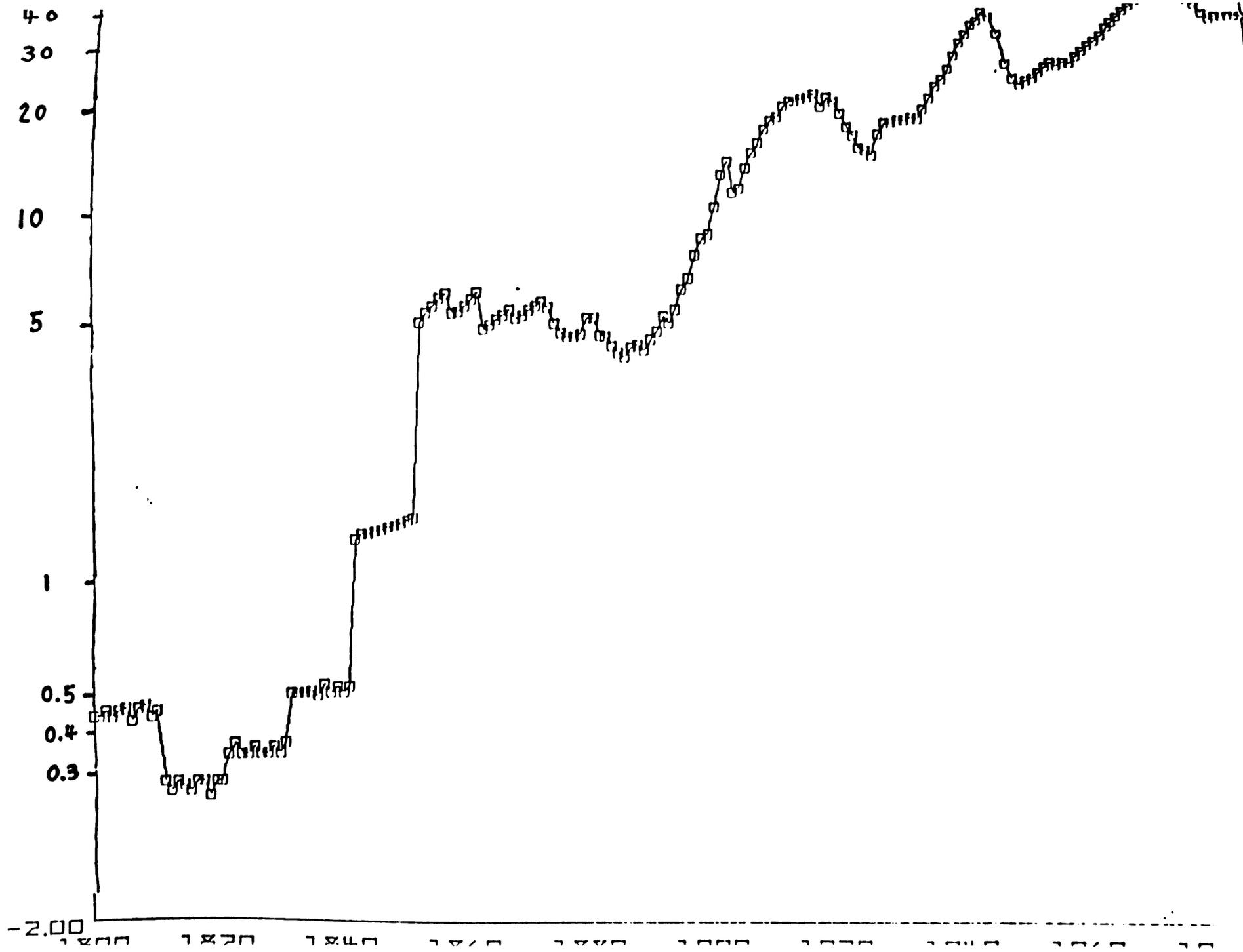
1. Gold Production Has Not Increased at a Constant Annual Rate from Subperiod to Subperiod

Chart 1 plots the yearly output of gold from 1800 to 1980. Table 1 compares subperiods since 1800, demarcating either changes in U.S. monetary arrangements or shifts in the profitability of gold mining, for which average annual rates of change in gold output are shown, with corresponding subperiods for available measures of the price level, for which average annual rates of change are shown.

Table 1

Period	Gold Output	Period	Price Level
	Average Annual Rates of Change (in per cent)		Average Annual Rates of Change (in per cent)
1800-1833	0.4	1800-1833	-0.93 (wholesale prices
1834-1848	7.1	1834-1848	-0.66 "
1849-1870	6.2	1849-1870	2.37 "
1871-1889	-0.3	1869-1896	-2.11 (NNP price deflat
1890-1913	6.0	1896-1913	1.97 "
1920-1933	3.4	1920-1933	-3.90 "
1934-1940	7.0	1934-1940	0.66 "
1950-1968	2.7	1950-1968	2.64 (GNP price deflat
1969-1980	-1.6	1969-1980	6.50 "

Averaging over periods of high and low growth rates of gold production obviously yields a smoother picture. Similarly averaging over periods of a falling price level matching periods of low growth rates of gold production and periods of a rising price level matching periods of high rates of gold production yields a smoother picture of price change. But for contemporaries each period was distinct and exacted first the costs of deflation and then the costs of inflation. Appealing to a record of stable growth rates of gold output



as the assurance of a stable price level under the gold standard is plainly refuted by the data. The case for a gold standard should not be based on exaggerated claims for it.

It is clear that no gold standard was in operation over the post World War II inflation experience. That inflation was fueled by means other than rising gold output, which accounted for inflations before 1914 that were definitely less virulent than the postwar episode.

2. Changes in the Major Producing Areas

Fewer than a dozen countries have accounted for the bulk of the gold mined in each century for which estimates exist. South America's share of total world gold output rose from 36 per cent in the 16th century to a peak of 80 per cent in the 18th century, and then rapidly dwindled in the 19th and 20th centuries; currently it amounts to about 4 per cent of total output. The output of European gold mines declined from 41 per cent in the 16th century to 6 per cent in the first decade of the 19th century. A major discovery in Russia in 1814 increased the share of Europe's output by 1840 to the level in the 16th century, following which the relative importance of the continent's contribution declined to 1 per cent by 1925. Russian output since then has accounted for a rise in the continent's contribution to 21 per cent in 1980. U.S. discoveries in 1848, and Australian discoveries in 1851 raised the combined shares of the two areas to 80 per cent of total world output by 1855, with a gradual decline thereafter to 56 per cent by 1895. A major discovery in Canada in 1896 restored the North American plus Australian share of the total to 58 per cent in 1905. The decline in the following decades reduced the combined share to less than 10 per cent in 1980. Gold output of South Africa made a significant contribution from the beginning of the 20th century, rising consistently except in the decade of the 1930s

until it accounted for two-thirds of total output by 1970. Since then it has declined to about 55 per cent in 1980.

There are thus fluctuations not only in the average annual aggregate output of gold but also in the geographical sources of increments to the gold stock.

The current nine leading gold-producing countries accounting for 91.4 per cent of total gold output in 1980, and their shares were as follows:

<u>Country</u>	<u>Share of Total Gold Output in 1980 (in per cent)</u>
Republic of South Africa	55.6
U.S.S.R.	21.3
Canada	4.1
Brazil	2.8
U.S.A.	2.4
Philippines	1.8
Australia	1.4
Ghana	1.0
Zimbabwe	0.9

The Union of South Africa and the U.S.S.R., the major gold producing countries, are regarded by some observers as politically unreliable sources of gold. Whatever the weight that should be attached to this view, these countries determine the quantity of gold to market annually independently of the decision of the quantity to mine, as will be indicated in the section below on the supply of gold.

U.S. new gold output, which declined from 1.7 million ounces in 1970, to 0.95 million ounces in 1980, was supplemented in that year by private refiners' recovery of secondary gold from scrap, amounting to 2.2 million ounces, and by commercial imports, amounting to 4.5 million ounces.

3. World Gold Reserves

As with any exhaustible resource, the estimate of gold reserves is based on current economic minability. Other identified deposits that are known are not currently economic to mine. It is also always possible that undiscovered gold may remain to be found.

The best estimate of world gold reserves is that it approximates 1 billion ounces — compared to 1.8 billion ounces that have been mined over the past 50 years. Half of the 1 billion ounces is in South Africa, half of the other half in the U.S.S.R. Other identified deposits total about 0.2 billion ounces. These estimates are subject to upward revision. It may be that the rise in the price of gold since 1973 has not yet been reflected in the calculation of demonstrated and inferred reserves, which depend on detailed information about hundreds of deposits.

Since South African reserves are so large a fraction of total world reserves, it is important to examine key aspects of the estimation of that country reserves. In 1970, it was widely believed that its gold mining industry could not survive, given rising costs of production and a falling real price of gold. Since the increase in the price of gold led by 1980 to a ten-fold increase in capital spending on producing mines plus additional amounts for the development of new mines not yet in production. While milling capacity of the industry expanded over the decade, there was no corresponding increase in the output of gold. In fact, output fell steadily from 32.1 million ounces to 21.7 million ounces. The reason is that the average grade of ore milled by gold mines fell from 13.3 grams per ton in 1970 to 7.3 grams per ton in 1980. There is no expectation that the level of production will rise in the 1980s, barring a dramatic change in the relationship between the price of gold and costs of production. The rise in costs has been associated with a substantial

increase in the industry's wage bill and improvements in the living quarters for black workers, which are planned to continue. High capital costs also confront the industry. They deter expansion of existing mines mining lower grade ore, and also the reopening of mines that were uneconomic when the gold price was fixed.

Gold mining in South Africa is a labor-intensive industry. Mechanization of the goldfields is impractical because of the depth at which mining has to be carried out, the hardness of the rock that has to be excavated to develop access tunnels, the high temperatures of the rock, and the narrowness of the orebody. Most of the people employed are black migratory workers whose families remain in tribal homelands. Movement of blacks into skilled work is opposed by white trade union members, posing an obvious labor problem for the industry.

The calculation of South African ore reserves depends critically on the concept of pay limit, which is the minimum quantity of metal in a ton of rock sufficient to yield the revenue to cover costs of mining, processing, and marketing gold. The reserves usually include ore available for extraction within a year. All gold mines in South Africa lease mines from the State subject to the restriction that the company must mine to the average value of its published ore reserves. When the price of gold was fixed, the pay limit rose as mining costs increased; since the 1970s, the pay limit has declined when the price of gold has risen and risen when it declined. In some mines, a relatively minor change in the pay limit can make significant tonnages of low grade ore payable or unpayable, with large effects on the total ore reserve. Whereas pay limits formerly were reviewed once or twice a year, the practice now is to review them monthly. The objective is to limit the number of places that have to be stopped before they have been worked out, so that grade control can be achieved as working places are exhausted.

Projections of South African gold output, assuming a current gold price of \$305 and rising to \$407 by 1984, then rising at the same level as costs until 2000, or alternatively, a current price of \$450, rising to \$554 in 1984 and then remaining constant in real terms until 2000, are broadly similar: annual gold output totals 22.5 million ounces until 1987 and then gradually declines to 11.25 million ounces by 2000.

One other determinant of South African gold output must be mentioned. A state assistance program was introduced in 1968 to subsidize gold mines that were no longer profitable, thus enabling marginal mines to remain in operation. If the price of gold should decline, the amount of state assistance, which was negligible in 1980, could again rise. The State's motive in providing assistance was to obtain foreign exchange from sales of gold output and incidentally avoiding capital costs of re-opening mines at a later date when their operation might become economic.

While information relating to South African gold mining is very fully reported, figures neither for annual output nor for reserves of gold are published by the U.S.S.R. Publication of statistics of gold output was prohibited by the Soviet government in 1926, data about geological deposits were discontinued in 1934, and the gold reserves of the State Bank have been secret since 1935. A series of Western estimates, using a variety of methodologies, have been subject to substantial revision from time to time.

An early estimate was based on an announcement in a Five Year Plan that prospecting had raised known deposits from 79.4 million ounces in 1926 to 111.5 million ounces in 1934. The Gold Mining Administration Director at that time predicted that Soviet gold production would surpass that of the South African Rand and lead the world. The prediction was empty but encouraged Western estimates of Soviet output of 18.3 million ounces and monetary reserves ranging as large as 272 million ounces.

A 1964 revision by the CIA of those estimates reduced the estimate of annual output to a range of 4.3 million ounces to 4.9 million ounces and of monetary reserves to 56 million ounces. Western observers thereafter used the CIA figures which were reputedly based on a Party document a Soviet defector provided.

Consolidated Gold Fields Ltd. made an effort subsequently to produce its own estimates, initially by translating and collating Soviet press reports and technical papers available in the West. The Soviet sources gave percentage estimates of the extent to which targets had been met in individual gold producing areas and the rate of growth of output and additions to ore reserves. No targets or production figures were given by the sources. In 1974, the company adopted a different approach to estimating Soviet gold production, based on information about the type and size of equipment and processes that were being used in mining and extracting gold. Relying on comparison with similar workings elsewhere, the gold content of the material treated was estimated from the nature of each operation and the numbers, types and sizes of machines being used. Between the first and second study, substantial upward revision of the estimates resulted from a re-examination of publications on reef mining. More attention had been placed on alluvial mining in the company's first study because the Soviet press and radio publicized developments there rather than in reef mining, which presumably contributed more to aggregate gold output than previously had been assumed. The second approach yielded an overestimate because it assumed that Soviet production was as efficient as in the West.

Currently, Consolidated Gold has under way a third study using satellite photographs in addition to the earlier techniques. At this stage, although the company estimates that Soviet annual output is in the range of 9 to 11 million ounces, in no year since 1968 has the annual figure it reports been

as high as 9 million ounces. The estimate it gives for 1980 is 8.3 million ounces. The company assumes that sales to the West by the communist bloc of 12.9 to 13.2 million ounces per year in 1976-78 required drawing down stocks. Communist bloc sales include, in addition to sales by the Soviet, smaller amounts by Communist China and North Korea. The decline in sales to the West by the bloc since 1978 has been attributed to the availability of an alternative source of foreign exchange -- oil and gas sales -- which reduced the need to market gold abroad.

What is currently known or assumed to be known about world gold reserves therefore suggests that gold output until the end of the century will continue the declining trend that has existed since 1970.

4. Components of the World Gold Supply

The supply of gold does not depend solely on new gold mined, although for the world as a whole the production of market economies is the principal component. Most gold producers in this sector sell all their annual output. The exceptions include South Africa and Canada. South Africa was reluctant to sell its output in 1976-77 when the price of gold declined, although it had a large balance of payments deficit. Instead of selling gold, it arranged a swap of 8.0 million ounces of gold for foreign currency, with the option to repurchase the gold at the swap price plus interest. In 1979, it exercised the option and bought 3.9 million ounces of the swap total, selling most of it at the current high price, and adding the remainder to its gold reserves. In other years since 1960, South African gold sales have been more or less than current output, depending on the market price of gold, the price of diamonds and other minerals the country exports, and its balance of payments.

Canada has sold gold on occasion in excess of current output to reduce the size of its gold reserves. Other countries from time to time require their domestic producers to allocate part or all of their output to the central bank. On the whole, however, gold production in market economies flows to the supply markets of the world.

The supply components other than the output of market economies are intermittent, fluctuating from year to year when present, and absent altogether in other years. These components include:

- a) the flow from centrally planned economies
- b, sales by official monetary institutions
- c) sales of jewelry hoards by developing countries
- d) sales of private bullion hoards

a) As noted, the flow of gold to the market from the communist bloc has fluctuated with its need for foreign exchange. There were no sales in the five years 1966-70, when the bloc was a net purchaser. Sales have ranged from 13 million ounces per year in 1976-78, as noted above, to 1.7 million ounces in 1971. In 1980, the bloc sold 2.9 million ounces.

b) Net sales by official institutions were limited to the years 1966-68, 1971, 1973-79. They ranged from 0.2 million ounces in 1973 to 45.1 million ounces in 1967.

c) Jewelry sales by developing countries amounted to 1.7 million ounces in 1974 and 4.2 million ounces in 1980. In other years, developing countries absorbed gold jewelry.

d) Disharding of private bullion holdings contributed to the supply of gold only in the years 1969-72, when it ranged from 0.1 million ounces to 11.0 million ounces.

Annual World Gold Supply and Gold Output, 1950-1980
(millions of fine troy ounces)

	Production in Market Economies (1)	Flow from Centrally Planned Economies (2)	Official Sales (net) (3)	Jewelry Sales by Developing Countries (4)	Dishoarding of Private Bullion Holdings (5)	Annual Total Supply (1) + (2) + (3) + (4) + (5) (6)	Annual World Output (7)
1950	24.3					24.3	28.3
1951	23.7					23.7	27.6
1952	24.4					24.4	28.4
1953	24.2	2.2				26.4	28.2
1954	25.5	2.2				27.7	29.5
1955	26.8	2.2				32.5	30.8
1956	27.8	4.3				32.1	31.9
1957	29.0	7.4				36.7	33.0
1958	29.9	6.3				38.5	34.2
1959	32.1	8.6				43.7	36.5
1960	33.5	5.7				39.2	38.2
1961	34.7	8.6				43.3	39.6
1962	37.3	5.7				43.0	41.6
1963	38.6	15.7				56.9	43.1
1964	40.0	12.9				54.7	44.8
1965	41.0	11.4				52.4	46.2
1966	41.0		1.2			42.2	46.6
1967	39.8		45.1			84.9	45.7
1968	40.1		19.9			60.0	46.2
1969	40.3				1.7	42.0	46.6
1970	40.9				11.0	51.9	47.5
1971	39.7	1.7	3.1		0.1	44.6	46.5
1972	38.1	6.8			3.2	48.1	44.8
1973	36.0	8.8	0.2			45.0	43.3
1974	32.4	7.1	0.6	1.7		41.8	40.1
1975	30.7	4.8	0.3			35.8	38.5
1976	31.2	13.2	1.9			46.3	39.2
1977	31.2	12.9	8.6			52.7	39.1
1978	31.5	13.2	11.6			56.3	39.3
1979	30.9	6.4	17.5			54.8	39.2
1980	30.3	2.9		4.2		37.4	39.1

Table 2 lists the components of the world gold supply annually from 1950 to 1980 and compares the total with the corresponding annual world output. The movements in supply are more erratic than those in gold output.

5. Summary

The rate of growth of gold output over the centuries has waxed and waned. Since World War II, output grew at about 3 per cent per year until 1970, and has since declined at about 1.5 per cent per year. The most important gold producer among market economies is South Africa. Factors that would operate to continue the downward trend in South African output include a government mandated shift to lower-grade ores when the average gold price rises, inflation effects on labor and capital costs, shortages of skilled labor and labor unrest, as well as the high costs associated with deep mining. Offsetting these factors are the possibility of discovery of new gold fields and uranium revenues, since the mineral is found in one-sixth of South African gold mines. Gold output in the United States and Canada, including byproduct gold production mainly from copper mining, has also displayed a negative postwar trend, although a rise in gold prices has encouraged reopening of mines and exploration. Brazil has become a recent gold producer, although its output is not consequential. Among Communist countries, the U.S.S.R. is the leader, estimated to produce about one-fifth of the world's output, although its sales are not geared to production but to balance of payments needs. Until the end of this century, little increase in annual world gold production is in prospect.

Advocates of a return to the gold standard tend to dismiss concern with the prospective rate of growth of world gold output. Yet the amount of gold available for annual additions to the stock of monetary gold is a crucial factor in determining the trend of the price level under a gold standard. If the annual rate at which the monetary gold stock increases is below the rate of population growth and real income growth, the consequence is a declining trend in the price level.

How do we know this? Extensive studies of the per capita demand for money have shown it to be determined by per capita real income and an interest rate representing the yield on an asset alternative to holding money. If the supply of monetary reserves will not match the growth in demand for money, the price level will fall. It was not by coincidence that the negative rate of gold output growth from 1871 to 1889 was associated with a declining price level in the United States and worldwide until 1896. The decline in the price level was the consequence of the decline in the rate of gold output growth concomitant with a rising world demand for gold. Similarly, the decline in the price level during the 1920s was a consequence of the fall in the rate of gold output during that decade. In each case, the declining rate of gold output was a response to an earlier decline in the real price of gold.

A declining trend in prices may seem a desirable development after decades of a rising price level. However, such a change would impose two kinds of costs of adjustment upon the economy: (1) transition costs in moving from an inflationary to a deflationary environment; (2) continuing costs of a deflation, assuming continuance of a gold standard. The costs might be regarded as tolerable if they affected all markets proportionally, so borrowers and lenders, workers and employers, retired and active labor force participants, urban and rural families, were all equally burdened. No more than the costs of inflation, however, will the costs of deflation be so distributed. Should we knowingly adopt a standard that, given the current prospects of gold output, produces such a result? To improve the condition of the economy, should we not rather seek a stable solution for the price level?

I propose that at the next meeting, discussion focus on international aspects of a gold constraint. Such a discussion may help the member who stated that he did not understand the relation between a fixed price for gold and the achievement of domestic price stability. I shall try to prepare a memorandum on the international issues to be circulated before the next meeting.

Another item for the agenda is discussion of the proposal contained in Mr. Costamagna's paper entitled "Convertibility."

My original intention was to circulate a memorandum on the demand for gold as a companion to the one on the supply of gold, but there is not enough time between meetings for me to do both. I therefore propose that the subject of the demand for gold and possibly the price of gold be postponed for a meeting subsequent to the one on October 9.

estimated deficit for this year alone is approximately \$18 billion. That in itself would indicate that we have a horrible fiscal policy we are embarked upon.

Mr. ALLOTT. The Senator is correct. Mr. President, I yield the floor. I am ready to vote.

The PRESIDING OFFICER (Mr. McGee in the chair). The question is on agreeing to the amendment of the Senator from Colorado.

Mr. ALLOTT. Mr. President, I ask for the yeas and nays.

The yeas and nays were ordered. The PRESIDING OFFICER. The question is on agreeing to the amendment of the Senator from Colorado. On this question the yeas and nays have been ordered, and the clerk will call the roll.

The assistant legislative clerk called the roll.

Mr. BYRD of West Virginia. I announce that the Senator from Alaska [Mr. BARTLETT], the Senator from Massachusetts [Mr. KENNEDY], the Senator from Missouri [Mr. LONG], and the Senator from Oregon [Mr. MORSE] are absent on official business.

I also announce that the Senator from Pennsylvania [Mr. CLARK], the Senator from Mississippi [Mr. EASTLAND], the Senator from Arkansas [Mr. FULBRIGHT], the Senator from Tennessee [Mr. GORE], the Senator from Michigan [Mr. HART], the Senator from New York [Mr. KENNEDY], the Senator from Ohio [Mr. LAUSCHE], the Senator from Washington [Mr. MAGNUSON], the Senator from Arkansas [Mr. McCLELLAN], the Senator from Minnesota [Mr. MONDALE], the Senator from Oklahoma [Mr. MONRONEY], the Senator from Wisconsin [Mr. NELSON], the Senator from Rhode Island [Mr. PASTORE], the Senator from Virginia [Mr. SPONG], and the Senator from Georgia [Mr. TALMADGE] are necessarily absent.

I further announce that, if present and voting, the Senator from Pennsylvania [Mr. CLARK], the Senator from Tennessee [Mr. GORE], the Senator from Michigan [Mr. HART], the Senator from Massachusetts [Mr. KENNEDY], the Senator from New York [Mr. KENNEDY], the Senator from Washington [Mr. MAGNUSON], the Senator from Minnesota [Mr. MONDALE], the Senator from Oklahoma [Mr. MONRONEY], the Senator from Oregon [Mr. MORSE], the Senator from Wisconsin [Mr. NELSON], and the Senator from Rhode Island [Mr. PASTORE] would each vote "nay."

Mr. DIRKSEN. I announce that the Senator from Kansas [Mr. CARLSON], the Senator from Kentucky [Mr. MORTON], the Senator from California [Mr. KUCHEL], and the Senator from Vermont [Mr. PROUTY] are necessarily absent.

If present and voting, the Senator from California [Mr. KUCHEL] would vote "nay."

The result was announced—yeas 19, nays 58, as follows:

[No. 62 Leg.]

YEAS—19

Allott	Curtis	Fong
Baker	Dominick	Griffin
Cotton	Fannin	Hansen

Hatfield
Hickenlooper
Hruska
Jordan, Idaho

Miller
Murphy
Thurmond
Tower

Williams, Del.
Young, N. Dak.

NAYS—58

Aiken
Anderson
Bayh
Bennett
Bible
Boggs
Brewster
Brooke
Burdick
Byrd, Va.
Byrd, W. Va.
Cannon
Case
Church
Cooper
Dirksen
Dodd
Ellender
Ervin
Gruening

Harris
Hartke
Hayden
Hill
Holland
Hollings
Inouye
Jackson
Javits
Jordan, N.C.
Long, La.
Mansfield
McCarthy
McGee
McGovern
McIntyre
Metcalf
Montoya
Moss
Mundt

Muskie
Pearson
Pell
Percy
Proxmire
Randolph
Ribicoff
Russell
Scott
Smathers
Smith
Sparkman
Stennis
Symington
Tydings
Williams, N.J.
Yarborough
Young, Ohio

NOT VOTING—23

Bartlett
Carlson
Clark
Eastland
Fulbright
Gore
Hart
Kennedy, Mass.

Kennedy, N.Y.
Kuchel
Lausche
Long, Mo.
Magnuson
McClellan
Mondale
Monroney

Morse
Morton
Nelson
Pastore
Prouty
Spong
Talmadge

So Mr. ALLOTT's amendment (No. 609) was rejected.

The PRESIDING OFFICER. The bill is open to amendment. If there be no amendment to be offered, the question is on the third reading of the bill.

The bill was read a third time.

Mr. SPONG. Mr. President. The Senate currently is considering legislation to remove the 25-percent gold reserve behind Federal Reserve notes.

The Senate Banking and Currency Committee, which has jurisdiction over this matter and on which I serve, had before it many distinguished witnesses who argued for the removal of the gold cover. Some of those appearing were David Rockefeller, William McChesney Martin, and Milton Friedman.

The testimony of William McChesney Martin, Jr., Chairman of the Board of Governors of the Federal Reserve System, was among the most persuasive presented to the committee. He described our current predicament: At the present time we have gold stocks of approximately \$12 billion, and a current gold cover requirement of \$10.7 billion. Thus we have \$1.3 billion in "free gold." The normal annual increase in gold required as reserves for domestic use is \$700 million. In 2 years—without making allowances for an outflow of gold to foreign countries—the available "free gold" will be depleted.

With these facts facing us, Chairman Martin said that it was apparent that the gold reserve would have to be removed in order for the country to meet the currency demands of our growing economy and to make it absolutely clear to the world that the United States would maintain the convertibility of the dollar into gold.

Chairman Martin anticipated the consequences of not totally eliminating the gold cover when he said:

Speculation against the dollar might be encouraged if the gold cover requirement were regarded as immobilizing part of our reserves; the labeling of only part of our gold reserves as "free" might seem to imply that the rest of our reserves are somehow

unavailable to perform their primary function of maintaining the convertibility of the dollar. Any possible misunderstanding on this point should be put at rest. This legislation would do that.

Faced with the current status of our gold stocks, the prospects of further deficits in our international balance of payments, and continuing pressure on the dollar abroad, I believe that Congress has no alternative but to remove the gold cover.

But it should be made clear that the removal of the gold cover will not solve the U.S. balance-of-payments problem, but will only enable us to take necessary remedial action.

This is the point made effectively by the American Bankers Association when it reversed its previous opposition to the removal of the gold cover and stated:

The continued efficient operation of the international monetary system—based upon gold and the dollar—is threatened by the statutory requirement that Federal Reserve Notes be backed by 25 percent in gold.

The ABA pointed out that the removal of the gold cover would be useless unless the Congress and the administration take firm steps to eliminate our chronic balance-of-payments deficit.

I agree that we must not waste the time we buy by the removal of the gold cover. The United States must take decisive action to bring our balance of payments into equilibrium. The strength of the dollar and the health of the international monetary system will be seriously threatened by a continuance of this deficit.

The first step in meeting this problem is a limitation on the inflationary pressures in our economy. There must be a reduction in Government expenditures and a limit on deficit spending by the Federal Government.

Painful as it may be, Congress must go beyond this and enact programs to limit both business and governmental expenditures abroad, to expand exports, and to increase the flow of funds to our shores.

If we do not take vigorous action now we face a real threat of the devaluation of the dollar and the resulting consequences.

Mr. BROOKE. Mr. President, as a member of the Banking and Currency Committee, I reluctantly voted for repeal of the gold cover. I will do so again today in the belief that this represents the only responsible course open to the Congress at this time.

In 1944, at Bretton Woods, the United States pledged that it would freely buy and sell gold at the fixed price of \$35 an ounce. That pledge is the keystone of the International Monetary Fund, which for 27 years has operated to prevent such worldwide monetary crises as those which occurred before World War II, and which would be so much more disastrous in the even more interdependent world of today. There is nothing selfless about this willingness of the United States to "give away" gold for dollars; the preservation of international financial stability is as important to the United States as to any other nation. An international monetary system based on the

North Atlantic Alliance since its inception. At the same time, I believe our distinguished majority leader has been performing a notable service to the country in singling out and judiciously dealing with the question of whether we really must, for all time, keep more than five divisions of American troops on the soil of Western Europe. With every recognition for the great complexity of the question, I just cannot believe that we must stay locked into an ironclad commitment of indefinite duration to keep so large a number of American troops in Europe.

I do not go so far as to say—as some European commentators have—that it is only necessary for one American soldier to be placed in a position of jeopardy on the borders of Eastern Germany to insure the credibility of the continuing American commitment to the defense of Western Europe. Neither do I argue that a mere token force of a few battalions is all that is needed to preserve European confidence in the validity of the American pledge. What I do say, however, is that neither military, political, nor psychological grounds exist for believing that a force of more than five divisions must be held as sacrosanct.

I strongly recommend to the executive branch of our Government that they immediately undertake conversations with our NATO allies to secure their understanding and cooperation concerning our balance-of-payments problem and the central role played in that problem by the nature of our military expenditures. Surely, we could present to them more forcefully than we have the fact that they are making virtually no contribution in support of our fearsomely expensive—both in terms of men and money—commitment in Southeast Asia. On the contrary, it is a plain fact that the developed countries are economically benefiting from the war in Vietnam in balance-of-payments terms.

It may well be that such a new and forceful presentation of the case to our European friends will not result in any agreed action, much less a consensus. In that event, having undertaken the kind of consultation required by both the letter and the spirit of our alliance, I would then proceed unilaterally to substantially reduce the number of American troops stationed in Western Europe—mindful that the Western Europeans themselves are rich and fully capable of making up the difference in the interests of their own defense.

In doing this I would make it entirely clear to our allies that only the most urgent financial difficulties are compelling us to take such a course.

Under these circumstances, I believe that our allies would see that our hand was forced and not that our ultimate commitment to share in the defense of Europe had changed. There might be the shock which comes from first plunging into a pool of cold water, but I feel certain that the European temperature would quickly adjust to that of the pool. It is even conceivable that the Europeans themselves might undertake to do far more than they have done in defense of their security interests—and I feel strongly that they are in a financial position to do so.

Mr. President, it seems clear to me that the United States is overextended and overcommitted abroad and the Government is continuing to refuse to acknowledge this fundamental fact. The measure that is now up for consideration is no more than a palliative: a way of continuing to evade the verities of our situation and the actions needed to correct it. For these reasons, I must cast a protest vote against the bill.

Mr. DIRKSEN. Mr. President, I ask for recognition.

The PRESIDING OFFICER. The Senator from Illinois is recognized.

Mr. COOPER. Mr. President, may we have order?

The PRESIDING OFFICER. The Senate will be in order.

Mr. DIRKSEN. Mr. President, when I left my office last night—and it was late—I was deeply distressed in spirit. I felt reasonably sure that I was going to vote for this bill.

I listened to the Chairman of the Federal Reserve Board at our policy luncheon on Tuesday. He made what appeared to be a persuasive case. Then, today two other things happened. First was the meeting in the office of the majority leader, attended by Mr. Martin, Chairman of the Federal Reserve Board, the Secretary of the Treasury, and perhaps a dozen Senators. It was stated there that this was D-day; we were at the bottom of the barrel; which meant, of course, that we were right at the 25-percent limit, and from here on out it would appear that we could not meet our commitments.

I regret to say, Mr. President, that that is not quite the whole story. I was further distressed this afternoon in the Committee on Finance when first the distinguished Senator from Delaware [Mr. WILLIAMS], and subsequently the distinguished Senator from Florida [Mr. SMATHERS] offered an amendment to the excise tax bill which will be on this floor very shortly. In that amendment they proposed an \$8 billion cut in expenditures, and a 10-percent surtax. On both occasions I voted for the proposal and I would do it all over again.

It seems to me that it is the only sensible proposal to meet our budget deficit and come to grips with this gold imbalance in our international payments. The country and the world is watching us. One would think that tomorrow morning the sky is going to fall. Anybody who has lived in my generation must remember the story about Chicken Little, which I learned as a child. One will recall that Chicken Little mentioned that the sky fell in.

With the gyrations of the stock market today, and, at last count, having dropped by 11 points, it would appear that we expect doom sometime tomorrow. But there will be no doom because there is a story in connection with this bill that either has not been told or I have not heard it.

The Congress saw fit a few years back to amend the Federal Reserve Act and to provide that all of our gold is free; every bit of the \$11.9 billion we still have left. However, it is available only because a penalty is attached and because it is

self-disciplinary. The question is, Are we prepared to accept that discipline?

The law provides authority for the Federal Reserve System to drop the 25-percent reserve requirement in an emergency. No legislation is required to authorize this; it can be done now. But, there is a penalty. That penalty is charged against the Federal Reserve System and all the banks that belong to the system. It means an increase in the rediscount rate. This is a course that those in authority do not like to take. But when the pain is there, it should be suffered. Was it not Jacob of old who said, "Lord, let me not die without pain"?

This is the pain that we wrote into the statute, that gold reserves can automatically drop from 20 to 17½ percent. And there is still a penalty because the rediscount rate must be raised. The law provides for that. If there is anyone who doubts it, let him stand up in his place now and dispute what I say.

We can drop that reserve to 15 percent, or roughly \$6.1 billion, but there is another penalty, and that penalty is an increase in the rediscount rate, which means that when we get down to 15 percent, the rediscount rate will be 7½ percent, and it must be charged against the banks in the Federal Reserve System. That is the law. We wrote that law. It is on the books today.

I am a little bit surprised that it has not been alluded to in the conferences I have attended, and in the discussions where I have had a chance to participate. I said nothing about it because I thought that was the business of someone else, either from the Federal Reserve System or from the Committee on Banking and Currency. But that is where we are tonight, as we prepare to vote on this bill.

The sky is not going to fall. The stock market can go down, as it has done so many, many times; but the gold will still be intact. It can be paid out below the 25-percent reserve; but someone must pay the bill. That someone is the Federal Reserve System, in the form of an increased rediscount rate.

It means that the commercial banks of the country, when they want to borrow from the Federal Reserve, are going to have to pay the higher rate. They do not want to pay the higher rate. If I were a big banker, I probably would not want to do it, either. But that is not the question here. The question is whether, tomorrow morning, when the bill is passed, whether we are out of gold or whether we are not, or whether we can pay out. We can pay out, any old time. We can meet our commitments as they come. But, it is going to cost us. Someone must pay the fiddler. That someone is going to be the Federal Reserve System.

If anyone wishes to dispute this argument, I will sit in my chair and let him take issue with what I say as to whether it is the law.

Thus, I am comforted somewhat in spirit tonight. I shall go back to my office and go home not quite so weary, not quite so dispirited, Mr. President, as I was last night, or as I was at 1:30, when I left Bill Martin and Henry Fowler with a heavy heart because I thought the sky was going to cave in.

Under the Constitution, it is the House which must initiate revenue bills. If the House does, it will be considered over here, as far as this Senator is concerned.

But that bill has nothing to do with the balance of payments in any real sense. The real fact is that over \$30 billion of American money is held by foreigners overseas, and that is three times the amount of gold that we hold.

An American citizen cannot call upon this Government to pay in gold for any of the more or less \$330 billion of national debt that we owe, or for the currency that we have in this country. He cannot get gold for it, but foreigners can.

As long as we pursue the policy that we have been pursuing, of big national deficits in our foreign accounts—which many of us would like to do something to correct, but which we have been unsuccessful in doing—we are going to have this problem. We do not have enough gold to pay for that.

The Senator from Missouri [Mr. SYMINGTON] said he studied the figures—they sound correct—that since the beginning of World War II, if we include United Nations Relief and Rehabilitation Agency, lend-lease along with foreign aid, we have given away about \$180 billion. So we now find that the \$23 billion in gold that we had is down to \$11 billion. It will go down further, in short order, at the rate it is going because of the defense trade, and aid programs we have been pursuing.

Frankly, I have reserved judgment on this matter, as this matter has been debated. Listening to the debate, I have been convinced that what we do tonight is not going to make a lot of difference, because until our policies in international affairs are changed, such as stationing large amounts of troops in areas overseas where no war is going on, such as Western Europe and Japan, and as long as we continue the trade policies we have at this time, we are going to have a big deficit, and the gold will be gone sooner or later.

Frankly, I am beginning to be a little curious to see what is going to happen when the day finally arrives that we are no longer able to pay off.

Mr. SYMINGTON. Mr. President, will the Senator yield?

Mr. LONG of Louisiana. I yield.

Mr. SYMINGTON. Is it not true that in 1949 the United States had some \$24.6 billion in gold, and owed about \$7 billion abroad, whereas today, as of yesterday morning, the United States had \$11.400 million in gold, and owes abroad, in current liabilities that can be called tomorrow by foreign central banks, over \$30 billion?

Mr. LONG of Louisiana. The Senator is correct. That is the situation, and we have about one-third of what it takes to pay it.

Mr. SYMINGTON. Is it not true that, with the exception of the year 1957, we have run a deficit in our balance of payments every year since 1949?

Mr. LONG of Louisiana. Yes.

Mr. SYMINGTON. And is it not true that this deficit was accelerated sharply around 1958?

Mr. LONG of Louisiana. The Senator is correct.

Mr. SYMINGTON. Is it not true that every year in recent years we have been assured we were going to see the balance-of-payments deficit eliminated. Nevertheless, it is worse today than ever before in our history?

Mr. LONG of Louisiana. Yes.

Mr. SYMINGTON. Under those circumstances, does the Senator not think that before we decide whether we want the new currency now recommended by the International Monetary Fund we should work out with the other countries what the new currency should be and what will be the nature of the reserves behind it?

Mr. LONG of Louisiana. Mr. President, the Senator's argument makes a great deal of sense.

SEVERAL SENATORS. Vote! Vote!

Mr. LONG of Louisiana. Mr. President, I expect to yield the floor in a few moments, but if Senators think this Senator is going to sit down just by their shouting "Vote!" they do not know the Senator from Louisiana. I might decide to talk for a while.

There has been a series of actions by this country, in its foreign programs, that, on hindsight, have not been wise. One of them was the manner in which the Marshall plan was handled. It cost about \$17 billion. While all that giveaway was going on, it occurred to one of us to ask, "Suppose this thing actually works, and, after giving those countries \$17 billion, they become prosperous and are able to pay it back; would it not be better to lend it on generous terms?"

We were told, "Oh, they will never be able to pay. That will not work."

We can see now how valuable the advice of our State Department has been.

It has been suggested on other occasions that we might not need to have all those troops in Europe. We were told, "Oh, yes, you must not bring a single man home. You must maintain the six divisions, at all events. None of it must be reduced."

At times we have asked, "Cannot some of this aid be reduced, especially to the rich countries?" We were very long in doing anything about that.

I recall when former Secretary of the Treasury Robert Anderson during the Eisenhower administration said he was very much concerned about this matter, and pointed out how difficult it was to change outdated policies and get this thing turned around and headed in the other direction when circumstances had changed. We were told at that time that he did not have enough influence in the Cabinet to have his way, that others in the Department of State had more than he did, so he could not help us.

Mr. SYMINGTON. Mr. President, this is very important. May we have order?

THE PRESIDING OFFICER. The Senate will be in order.

Mr. LONG of Louisiana. So, Mr. President, tonight we do not have enough gold with which to pay; but at least most of these countries the central banks of which are calling for our gold owe us money; so tonight we have an

opportunity to ask them to pay us some of that.

Let us not fool ourselves; our State Department and our own banking people are very anxious to pretend that that debt does not exist, and get rid of that \$17 billion which those countries owe us. That will be the final foolhardy act. We cannot pay them, and still will not ask them to pay us. That will help American corporations dealing in those foreign countries, and will save some of those nations from the embarrassment of having to tell those companies that those companies will not be able to sell them as much of their commodities as they would like, or as much as they had planned to buy, because the United States is asking them to pay what they owe us. That embarrassment will be avoided, and that money saved, and perhaps there might be some satisfaction on the part of the State Department that our Ambassador will be spared embarrassment, and will be more socially acceptable in those capitals where he has been playing Santa Claus for all these many years; in that, at least for a short period of time, we will still be able to pretend that we can play that Santa Claus role a little longer.

But let us face it, Mr. President; it is those international policies, and the matter of the State Department prevailing over the Treasury year after year, that has put us in this situation. Sooner or later we are going to have to change some of those policies, and do something about our balance of trade, do something about the fact that we have a great flow of imports, in many industries, where we used to have a surplus. Until we do something about those things, we are just postponing the day, depleting our gold reserves to pay more and more gold out to try to postpone facing the fact that we are still continuing a series of policies adopted immediately after World War II, when we had all the world's gold.

We are still proceeding on the theory that we can afford policies which the Treasury has been telling both Democratic and Republican administrations for many years we could not afford, but as to which the State Department has been prevailing, time and time again, with first one President and then another. Finally the time must come that we have to face facts.

I shall be curious to see, if this bill passes tonight, what happens within a year, when all the gold is gone.

I recall when Douglas Dillon appeared before our Foreign Relations Committee during the Eisenhower administration and I asked him some questions about the fact that all the gold was going to be gone, the way it was going.

I recall his answer to me at that time. He said:

When the gold is gone, we can use something else as currency.

I have read the record subsequently, and it did not read that way. Someone who advised him in the State Department found some other language to use, but that is what the man said, and that is, in effect, the policy we have been pursuing.

So, as I say, Mr. President, I am getting more and more curious to see just what the answer to that \$64 question is going to be. What currency are we going to use when all the gold is gone?

Mr. MILLER, Mr. President, I shall not detain the Senate more than a minute; but, in response to the Senator from Louisiana, there was such an amendment on the floor this afternoon as he suggested. In response to my colleague from Illinois, the Senate had the opportunity this afternoon to do exactly what he is talking about.

Mr. LONG of Louisiana. Mr. President, will the Senator yield?

Mr. MILLER. The Senate will remember that my amendment provided for the \$8 billion cut in expenditures, and it also provided that the effective date of this bill we pass here would be the date of enactment of a 10-percent tax increase.

My fellow Senators did not see fit to agree to it. I can see why, a fortiori, they did not see fit to do it in the Finance Committee. But as sure as we are here tonight, the raising of the gold cover is not going to strengthen the confidence of the international bankers in the American dollar. The only way to do that will be for us to discipline ourselves by a expenditure reduction and a tax increase.

The Senate was unable to determine what we would face that decision this afternoon; and so, with the information the minority leader has given us tonight, I cannot support this bill.

Mr. BYRD of Virginia. Mr. President, shall be very brief.

In the pending legislation, the Senate is faced with two choices—each of which comes close to being unacceptable.

One is whether we refuse congressional action to permit our Government to purchase dollar with gold; the other is to give congressional authority which would lead to the dissipation of our energy gold supply.

I have been worrying about the matter for several weeks, and have read the 945 debates in the Senate when the gold cover supporting our domestic currency as changed from 40 to 25 percent. Clearly it was the conviction of nearly all Senators that there should be a gold backing to our currency.

As I see it, this Nation is facing a financial crisis—and at this late date there appears no good way to deal with it, any the least bad way.

The crisis we face in gold began in 1958.

It was in that year that we lost more gold than during any other year—\$2.2 billion. And it was during that fiscal year, which began July 1, 1958, that the United States ran up the biggest peacetime deficit in history—\$12.4 billion.

To me it is clear that there is a firm and definite relationship between deficit financing and loss of gold.

It first made itself manifest in 1958. It becomes dramatically evident this year when our gold loss is reaching a flood-de, resulting, I believe, from the continued and increased deficits which this year will approximate \$20 billion—and a predicted deficit for next year of \$15 billion, even if a 10-percent tax increase enacted.

The loss of gold results from the international loss of confidence in the future of the dollar; that confidence is lost because we consistently have refused to put our financial house in order.

It seems to me that our dollar can be weakened in the international markets regardless of which decision the Senate makes today. It has been ably and effectively argued by the distinguished chairman of the Senate Banking and Currency Committee, the Senator from Alabama (Mr. SPARKMAN), and by the distinguished senior Senator from Wisconsin (Mr. PROXMIER) that to refuse to eliminate the gold cover, thus making all of our gold available to foreign banks, would have a detrimental effect on the U.S. dollar overseas.

It has been equally effectively argued by such a recognized expert on international financial matters as the chairman of the board of the Swiss Bank Corp.:

The declaration that the dollar will be defended up to the last ounce of gold, is no longer being taken seriously by anybody and had better not be repeated, since it implies the possibility of developments which, if they should materialize, would be bound to shake the confidence in the dollar still more.

Everybody knows that a world power like the U.S. cannot afford the risk of being one day without a minimum of the only unconditionally acceptable means of payment, namely gold.

Just 3 years ago this month, the Congress took similar action as is being sought today. It enacted legislation to eliminate the gold reserve requirement for Federal Reserve bank deposits, thus freeing some \$5 billion in gold for use in meeting this country's international obligations.

That action was taken to give the Government time to correct the fundamental problem. The fundamental problem is deficit spending at home and abroad. Yet, deficit spending has continued and the deficits have increased.

Today—only 3 years later—that \$5 billion has gone with the wind. We now are faced with a new gold crisis.

In the last 10 years, the gold stock of this country has been reduced by almost half—from \$22.7 billion in 1958, to less than \$12 billion in 1968. There now remains only about \$1 billion of free gold available to meet this country's obligations in the world's money market.

Mr. President, at this point in my remarks I ask unanimous consent to have printed in the RECORD tables showing the decline in U.S. Treasury gold stocks from 1948 through 1967, the deficit in the Nation's administrative budget for the period 1948 through the current fiscal year, and the national debt during that period.

There being no objection, the tabulations were ordered to be printed in the RECORD, as follows:

U.S. Treasury gold stock, 1948-67
[In millions of dollars]

End of calendar year:	
1948	24,244
1949	24,427
1950	22,709
1951	22,695
1952	23,187
1953	22,030
1954	21,713

U.S. Treasury gold stock, 1948-67—Continued
[In millions of dollars]

End of calendar year—Continued	
1955	21,690
1956	21,949
1957	22,781
1958	20,534
1959	19,466
1960	17,767
1961	16,889
1962	15,978
1963	18,813
1964	15,388
1965	13,733
1966	13,159
1967 (November)	12,908
1967 (December)	11,984

Source: U.S. Treasury Department.

THE ADMINISTRATIVE BUDGET DEFICIT, FISCAL YEARS 1948 THROUGH 1968

[In millions of dollars]

	Receipts	Expenditures	Deficit	Debt
1948	41,375	32,955	+8,419	252,366
1949	37,663	39,474	-1,811	252,798
1950	36,422	39,544	-3,122	257,377
1951	47,480	43,970	+3,510	255,251
1952	61,287	65,303	-4,017	259,151
1953	64,671	74,120	-9,449	266,123
1954	64,420	67,537	-3,117	271,341
1955	60,209	64,389	-4,180	274,418
1956	67,850	66,224	+1,626	272,825
1957	70,562	68,966	+1,596	270,634
1958	68,550	71,369	-2,819	276,444
1959	67,915	80,342	-12,427	284,817
1960	77,763	76,539	+1,224	286,471
1961	77,659	81,515	-3,856	289,211
1962	81,409	87,787	-6,378	298,645
1963	86,376	92,642	-6,266	306,476
1964	89,459	97,684	-8,226	312,526
1965	93,072	96,507	-3,435	317,864
1966	104,727	106,978	-2,251	329,369
1967	115,849	125,718	-9,869	326,733
1968 estimated	118,575	137,182	-18,607	351,599

Mr. BYRD of Virginia. Mr. President, an examination of these tables makes clear that the loss of our gold began with the whopping \$12.4 billion deficit for the fiscal year beginning July 1958—and has reached floodtide with the prospect of two even greater deficits for 1968 and 1969; namely, \$20 billion and \$15 billion, respectively. As the national debt has gone up, our gold supply has gone down.

As I see it, what is needed to resolve our gold problem is to restore confidence in the fiscal policies of this Government. With each year of deficit spending in the United States, with each deficit in our balance of payments, and with each advance of inflation in this country, confidence in the dollar abroad has weakened.

If this were not the case, there would be no need for foreign governments and banks to make claims against our gold. They would be willing to continue to hold U.S. dollars in lieu of gold.

I believe we ought to look upon the uncomfortable position of the United States with regard to gold today as a constructive warning that something is basically wrong with the management of our fiscal affairs.

Gold, which puts some impersonal restraint on Government, is an alarm bell—and it has been ringing for 10 years.

It is like a fever, which is a sign there is a deeper sickness in the body.

Mr. President, in considering this legislation to put our last gold reserves in the pot, so to speak, it is appropriate to ask what we will have gained if the

overnment does not take the steps necessary to restore confidence in the dollar.

If nothing substantive is done about the basic problem, then I question whether we will not be merely feeding a new round of speculation and a new round of demands on our gold.

Yet the new budget which the President has submitted calls for new spending authorizations totaling \$16 billion—and budget figures show we face a deficit of \$15 billion next year—on top of a \$20 billion deficit this year.

So while the real cause of our current difficulties has not been corrected, we are asked to throw all of our gold in the pot in the assumption that this will restore international confidence in the dollar.

This is a gamble—just as it is a gamble in the international fate of our dollar not to make this gold available.

I reluctantly supported the Church-Tower amendment to cut the gold cover from 25 percent to 12½ percent, which would give the Government additional time to take firm steps to put our financial house in better order. But that failed by a vote of 40 to 45.

Now we are faced with two alternatives, each of which comes very close to being unacceptable.

I have concluded that our Nation cannot afford the risk of being without a minimum of the only unconditionally acceptable means of international payment; namely, gold.

Therefore, I shall vote against the pending legislation.

Mr. BENNETT. Mr. President, I will only take a minute or two to put into arithmetic the information that my beloved minority leader presented to the Senate.

I hope that no one will take comfort from that alternative, believing that it is unrelated altogether merely because it was only going to tax the bank. That alternative was explained in detail on the floor of the Senate in January.

It would have this effect. The Federal Reserve Board, as he announced, raised the rediscount rate to 5 percent today. The rediscount rate is the basis on which all interest rates, both for business and private loans, are based. And they are all higher, necessarily.

If we reduced the gold from the present 25 percent to a 20-percent cover, the rediscount rate would be raised to 6 percent. If we reduced it to 15 percent, the rediscount rate must be raised to 9 percent. And if we reduce it to the 12½ percent suggested by the Tower amendment, the rediscount rate would have to be raised to 10 percent.

That is the basic rate underlying our whole infrastructure. And if we were to put the gold down to 10 percent, the rediscount rate would be an impossible 12 percent.

I think any basic bank rate above 7 percent would be disastrous. So I just offer these figures to suggest that it is not safe to rely on this program, which was intended entirely to be an emergency situation that could be used for a day or two and then abandoned.

Mr. SPARKMAN. Mr. President, I wish to supplement what the distinguished

and able Senator from Utah has said. During the time that the Senator delivered his speech, I held before me the law. The law has not been read. First of all, this is what it says:

The Board of Governors of the Federal Reserve System shall be authorized and empowered—

Listen to this—

to suspend for a period of not exceeding 30 days, and from time to time to renew such suspension for periods not exceeding 15 days.

And each time that it takes that action, as the Senator from Utah has said, it must raise the rediscount rate. I believe the Senator said that when it gets to 12½ percent, the rediscount rate would be 9 percent.

Mr. BENNETT. Ten percent.

Mr. SPARKMAN. The distinguished minority leader said the Reserve banks have to pay that. It sounds pretty much as though it is a tax on the banks. But here is something else it says:

The tax shall be paid by the Reserve Bank, but the Reserve Bank shall add an amount equal to said tax to the rates of interest and discount fixed by the Board of Directors of the Federal Reserve System.

In other words, any bank, a member of the Federal Reserve, wanting to get money from the Federal Reserve, or to rediscount payment, would have to pay the basic rate of 10 percent.

Now, what does that mean? I was about to say "to your local banks." Let us go beyond that. What does it mean to the small businessman who has to go to that bank to borrow money? What does it mean to the homebuilder, to the man who wants to buy a house?

I have heard many Senators on the floor of the Senate deplore high interest rates. Yet, the alternative proposed to us is one that will drive interest rates sky high for the consumer, for the man who has to borrow money, for the small businessman, for the industrialist, and for everybody else.

He says it is something we should take; it is a discipline. It is a discipline for which the small businessman must pay. It is a discipline for which the family that wants to buy a home must pay.

We are now working on a housing bill. We are doing our best to provide a program under which people of low income can afford to buy homes. But if every bank has to pay a 10-percent rate, I shudder to think what the home buyer will have to pay. It would kill any chance we have to provide housing for people with low incomes.

Mr. SYMINGTON. Mr. President, will the Senator yield?

Mr. SPARKMAN. I yield.

Mr. SYMINGTON. Does the able and distinguished Senator from Alabama believe the working people of this country, all little people, are hurt more by high interest rates or by inflation. Apparently we want to eat our cake and have it, too; and have our guns, and also our butter? As a result, if we take off this cover and continue the present policies, as so ably pointed out by the distinguished chairman of the Committee on Finance, the distinguished Senator from Virginia, and equally by the distinguished minority

leader, will it really make much difference whether or not we have a high interest rate?

Is it more important to have a slightly higher interest rate—

Mr. SPARKMAN. Slightly higher? Ten percent basic.

Mr. SYMINGTON. It is slightly higher unless we want to lose all our gold.

Mr. SPARKMAN. No, 12½ percent.

Mr. SYMINGTON. This is the same old argument we have had before by those who do not fear inflation. If we vote to take this gold cover off, the dollar will be further devalued; and that will hurt the rich people some, but ruin the little people.

Mr. SPARKMAN. Mr. President, certainly, I dread inflation, and I will do everything I can to fight it. I have lived through two periods when we had price and wage controls in this country, and I do not want that experience again. I am against inflation. But do not think that pushing interest rates above 10 percent will cure inflation.

I support the tax increase. I do not know whether the Senator from Missouri supports it. I support it, because I believe it is necessary. I will support the budget cuts.

I have said many times on the floor of the Senate that we must do many things, that several steps must be taken. But we must take them step by step, and this is the initial step.

Something was said about the stock market today reaching a low point. I wish to make a prediction: If this bill is not passed tonight, the stock market will be worse than that tomorrow. In fact, I will hazard a guess that it will not even open.

Mr. President, I am ready to vote.

Mr. AIKEN. Mr. President, the cost of a home was doubled in the last 3 years, and the administration has done nothing about it. Have we any reason to believe they are any nearer right tonight than they have been in the last 3 years?

The PRESIDING OFFICER. The question is, Shall the bill pass? On this question, the yeas and nays have been ordered, and the clerk will call the roll.

The legislative clerk called the roll.

Mr. BYRD of West Virginia. I announce that the Senator from Alaska [Mr. BARTLETT], the Senator from Massachusetts [Mr. KENNEDY], the Senator from Missouri [Mr. LONG], and the Senator from Oregon [Mr. MORSE] are absent on official business.

I also announce that the Senator from New Mexico [Mr. ANDERSON], the Senator from Pennsylvania [Mr. CLARK], the Senator from Mississippi [Mr. EASTLAND], the Senator from Arkansas [Mr. FULBRIGHT], the Senator from Michigan [Mr. HART], the Senator from New York [Mr. KENNEDY], the Senator from Ohio [Mr. LAUSCHEL], the Senator from Washington [Mr. MAGNUSON], the Senator from Minnesota [Mr. MCCARTHY], the Senator from Arkansas [Mr. McCLELLAN], the Senator from Minnesota [Mr. MONDALE], the Senator from Oklahoma [Mr. MONROE], the Senator from Wisconsin [Mr. NELSON], the Senator from Rhode Island [Mr. PASTORE], the Senator from Virginia [Mr. SPONG], and the Sen-

r from Georgia [Mr. TALMADGE] are necessarily absent.

further announce that, if present [Mr. ANDERSON], the Senator from Pennsylvania [Mr. CLARK], the Senator from Michigan [Mr. HART], the Senator from Massachusetts [Mr. KENNEDY], the Senator from New York [Mr. KENNEDY], the Senator from Minnesota [Mr. MONROE], the Senator from Wisconsin [Mr. MURPHY], the Senator from Rhode Island [Mr. PASTORE], and the Senator from Virginia [Mr. SPONG] would each vote "yea."

In this vote, the Senator from Oregon [Mr. MORSE] is paired with the Senator from Georgia [Mr. TALMADGE]. If present and voting, the Senator from Oregon would vote "yea," and the Senator from Georgia would vote "nay."

In this vote, the Senator from Oklahoma [Mr. MONROE] is paired with the Senator from Arkansas [Mr. FULCRON]. If present and voting, the Senator from Oklahoma would vote "yea," and the Senator from Arkansas would vote "nay."

In this vote, the Senator from Washington [Mr. MAGNUSON] is paired with the Senator from Alaska [Mr. BARTLETT]. If present and voting, the Senator from Washington would vote "yea," and the Senator from Alaska would vote "nay." Mr. DIRKSEN. I announce that the Senator from Kansas [Mr. CARLSON], the Senator from Kentucky [Mr. MORFITT], the Senator from California [Mr. CHASE], and the Senator from Vermont [Mr. PROUTY] are necessarily absent.

In this vote, the Senator from California [Mr. KUCHEL] is paired with the Senator from Kansas [Mr. CARLSON]. If present and voting, the Senator from California would vote "yea," and the Senator from Kansas would vote "nay." The result was announced—yeas 39, nays 37, as follows:

[No. 93 Leg.] YEAS—39

Hayden	Moss
Hill	Muskie
Holland	Pell
Hollings	Percy
Inouye	Proxmire
Jackson	Randolph
Javits	Ribicoff
Jordan, N.C.	Scott
Mansfield	Smathers
McGee	Sparkman
McIntyre	Tydings
Metcalf	Williams, N.J.
Montoya	Yarborough

NAYS—37

Ervin	Murphy
Fannin	Pearson
Griffin	Russell
Gruening	Smith
Hansen	Stennis
Hatfield	Symington
Hickenlooper	Thurmond
Hruska	Tower
Jordan, Idaho	Williams, Del.
Long, La.	Young, N. Dak.
McGovern	Young, Ohio
Miller	
Mundt	

NOT VOTING—24

Hart	Magnuson
Kennedy, Mass.	McCarthy
Kennedy, N.Y.	McClellan
Kuchel	Mondale
Lausche	Monroney
Long, Mo.	Morse

Morton Nelson Pastore Prouty Spong Talmadge

So the bill (H.R. 14743) was passed.

Mr. MANSFIELD. Mr. President, for the past 3 days, the Senator from Alabama [Mr. SPARKMAN], the distinguished chairman of the Committee on Banking and Currency, has displayed his profound understanding of this Nation's fiscal status. His superb handling of this measure that would permit the 25-percent gold cover currently required to be used to maintain the security of the dollar, served more than anything to assure its success. With its adoption, the Senate has told the world in effect that we will go all the way to put every ounce of our gold behind the U.S. dollar and preserve its value. Let no nation be mistaken.

Might I say that no Senator has expressed those sentiments better, nor with more understanding, than did Senator SPARKMAN. He brought to the discussion the great wisdom and clarity of thought that has characterized his many years of public service. The American people are again grateful for his outstanding leadership.

The able and distinguished senior Senator from Utah [Mr. BENNETT] is similarly to be commended for adding his strong support to this measure. As the ranking minority member of the committee, he has consistently rendered invaluable service with his astute appreciation of our monetary position. His participation in this instance was no exception.

Other Senators, too, should be singled out for joining to assure the exceedingly successful disposition of this matter with such a highly thoughtful discussion.

The Senator from Wisconsin [Mr. PROXMIRE] displayed his particularly wise and broad understanding of international economics in urging the adoption of this measure. He argued with that same high degree of persuasiveness that has characterized his many outstanding contributions.

The opponents of the bill are also to be commended. With their splendid cooperation, the Senate was able to complete action with the reasonable dispatch that was required.

The distinguished Senators from Colorado [Mr. ALLOTT and Mr. DOMINICK] opposed the bill with strong and able advocacy urging amendments and making their views clearly understood. They in no way impeded its efficient disposition, however. Nor did the distinguished minority leader [Mr. DIRKSEN], whose strong and sincere views were expressed shortly before the final vote.

The distinguished Senator from Texas [Mr. TOWER] and the distinguished Senator from Nebraska [Mr. CURTIS] are similarly to be commended.

I only add that the Senate this evening rose to the occasion and unequivocally took what I believe will be the first of many significant steps that will secure our world economic condition. This is a fine beginning and presages, may I say to our friends abroad, similar steps in the not-too-distant future.

LEGISLATIVE PROGRAM—ORDER FOR ADJOURNMENT

Mr. MANSFIELD. Mr. President, tomorrow we will take up some of the money resolutions that have been on the calendar for almost 2 months.

Therefore, I ask unanimous consent that when the Senate completes its business today, it stand in adjournment until 12 noon tomorrow.

The PRESIDING OFFICER. Without objection, it is so ordered.

ORDER FOR ADJOURNMENT FROM TOMORROW UNTIL MONDAY

Mr. MANSFIELD. Mr. President, I ask unanimous consent that when the Senate completes its business tomorrow, it stand in adjournment until 12 noon on Monday next.

The PRESIDING OFFICER. Without objection, it is so ordered.

LEGISLATIVE PROGRAM—RECOGNITION OF SENATOR STENNIS ON MONDAY NEXT

Mr. MANSFIELD. Mr. President, I ask unanimous consent that at the conclusion of the transaction of routine morning business on Monday next the distinguished Senator from Mississippi [Mr. STENNIS] be recognized for the purpose of beginning debate on the resolution of the Select Committee on Standards and Conduct, which will be laid before the Senate today or tomorrow.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. STENNIS. Mr. President, that resolution will be the pending business.

Mr. MANSFIELD. Mr. President, that resolution will be the pending business at the conclusion of the transaction of routine morning business on Monday next, regardless of what happens to the money resolution tomorrow.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. STENNIS. Mr. President, will the Senator yield?

Mr. MANSFIELD. I yield.

Mr. STENNIS. Mr. President, the resolution will take the form of a proposed amendment to the standing rules of the Senate.

Tomorrow at noon, when the Senate convenes, I shall present the resolution together with the report thereon and a special explanation will be on the desk of each Senator. Theretofore, at 10 a.m. I shall send copies of the proposed resolution to the Press Galleries for release when introduced.

IMPROVEMENT OF JUDICIAL MACHINERY FOR THE SELECTION OF FEDERAL JURIES

Mr. TYDINGS. Mr. President, I ask that the Chair lay before the Senate a message from the House of Representatives on S. 989.

The PRESIDING OFFICER laid before the Senate the amendments of the House of Representatives to the bill (S. 989) to provide improved judicial machinery for the selection of Federal juries, and for

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

MEMORANDUM

To: Members of the Gold Commission
From: Anna J. Schwartz
Date: October 8, 1981
Subject: International Aspects of Monetary Standards

This memorandum summarizes the operation of:

1. a fixed-exchange-rate regime under an international gold standard
2. a fixed-exchange-rate regime under the Bretton Woods system
3. a dirty floating-exchange-rate regime.

Each system provides for the determination of the external value of a currency vis-a-vis other national currencies, that is, its purchasing power in foreign countries. The determination of the internal value of a currency, that is, its domestic purchasing power, can vary, depending on the constraints under each monetary standard.

Members of the Gold Commission are invited to discuss the following issues at the forthcoming meeting:

1. Do they favor a return to an international gold standard? Will they recommend convening an international monetary conference to obtain the agreement of three-fifths of the members of the IMF with 85 per cent of the votes to restore a fixed price for gold and the definition of each currency as a fixed gold weight? How would the fixed price of gold be determined? Will gold coinage be restored?

2. Do they favor a return to the Bretton Woods system of internationally agreed fixed exchange rates? How would discipline be imposed on the members so that par values would not become misaligned? What would be the role of gold in the system? Would domestic monetary policy be governed by the gold component of monetary reserves? How would the price of gold in the system be determined?

3. Do they favor the present floating rate system? Is there a role for gold in the system?

A monetary standard has two aspects, one domestic and one international. The domestic aspect applies to the arrangements regulating the quantity and growth rate of the internal money supply. The international aspect applies to the arrangements by which the external value of the currency is determined. These two aspects are present for any type of monetary standard, whether gold-backed, backed by other commodities, or an inconvertible paper standard.

Three types of international monetary arrangements are distinguishable. Each type may be examined in combination with one of three types of domestic monetary arrangements:

(1) an international gold or commodity standard, in which the external value of the currency is determined by the weight of gold (or other commodity) in a unit of the country's currency relative to the weight of gold (or other commodity) in a unit of other countries' currencies, with unlimited convertibility of all currencies into gold (or other commodity) at a fixed price, and with free export and import of gold. The quantity and growth rate of the internal money supply depend on gold flows into and out of the country, and on the obligation of the monetary authority to convert domestic nongold money into gold

(2) a system, such as prevailed during the Bretton Woods period, in which exchange rates between countries are fixed

by agreement, and the internal money supply is subject to discretionary management by monetary authorities

(3) a system, such as prevails currently, in which exchange rates between currencies are floating, determined by demand for and supply of a country's currency in foreign exchange markets (in the current example, subject to intervention by monetary authorities to raise or lower the market rate). Such a system can be combined with the internal money supply either determined by the fiat of monetary authorities or, alternatively, based on a unilateral domestic gold or commodity standard.

Let me describe the operation of each of these three monetary arrangements:

(1) International Gold Standard

The international gold standard is a mechanism to ensure uniformity of price level movements between countries and hence to constrain the monetary policy of any one country.

The external value of the currency under such a standard is fixed in terms of gold. For example, consider the reason the external value of a dollar in terms of a pound sterling was \$4.8665 before World War I and from 1925 to 1931. The dollar was defined as 23.22 grains of fine gold and a pound sterling as 113.0016 grains of fine gold, hence 4.8665 was

the multiple of the weight of gold in a pound sterling compared with the weight of gold in a dollar. This was a fixed exchange rate because the gold weight of each currency was fixed or, equivalently, the price of gold per ounce was fixed. If the United States had adopted one price of gold and the British another price, obviously, the equivalence between the exchange rate and the respective weights defining each currency would have disappeared. A variable price of gold among countries would have meant variable weights of gold represented by each currency.

The link between currencies was gold valued at a fixed price. Imbalances in international payments were settled in claims on the national currencies of other countries which had fixed gold equivalents, financed mainly by the use of bills of exchange. If the demand for and supply of a national currency did not balance, gold flows were activated. Thus whenever the dollar price of a British pound at the official or par exchange rate of \$4.86 deviated by more than one or two per cent above or below par (these limits, referred to as the gold points, represented the cost of transferring gold between the two countries), it paid either to convert U.S. dollars into gold and transfer it abroad, or else to convert British pounds into gold and transfer it here. If U.S. demand increased, for example, for cheaper British goods, this raised the dollar price of

the pounds (that is, bills of exchange). Once the dollar price of the pound reached \$4.92, referred to as the U.S. gold export point, it paid to convert U.S. dollars into gold, ship the gold to England and purchase pounds at \$4.86. Conversely, at the U.S. gold import point of \$4.83, it paid to convert pounds sterling into gold, ship the gold to the U.S., and purchase dollars. Gold shipments in either direction would then act to restore the price of foreign exchange to parity.

Gold flows required internal adjustments. In this way, a fixed price of gold acted to constrain the ability of any one country to allow its price level to differ markedly from the price level in the rest of the gold standard world. Internal price stability under the gold standard must be understood as referring to the discipline of moving in step with price level movements abroad, so that price increases in excess of the world average or price falls below the world average were reversed in response to movements in the country's monetary gold stock. The worldwide movement might be deflationary as from 1879 to 1896, or inflationary as from 1896 to 1913. Adherence to the gold standard imposed the requirement that each country accept the world price level.

By the same token, the gold standard fixed exchange rate system made individual countries vulnerable to disturbances

in economic activity that were transmitted from one country to another. A country could protect itself from a foreign disturbance or from deflationary or inflationary effects on its domestic prices by cutting the gold link.

Domestic disturbances could also affect the monetary gold stock, as in the case of a banking panic, when the public might demand gold rather than hold bank notes or bank deposits. Convertibility in the domestic arrangement jointly with the international arrangement was the mechanism to ensure that monetary policy was held in check. Note that convertibility signified the monetary authority's obligation to redeem nongold currency at the fixed defined weight of a unit, that is, at a fixed price of gold, not a changing market price of gold.

(2) Bretton Woods System

The Bretton Woods system was also a fixed exchange rate system in conception. The par value of each national currency was expressed either in terms of gold or in terms of the U.S. dollar of 13.71 grains of fine gold, each established in agreement with the International Monetary Fund. Members of the IMF were responsible for maintaining the par value of their currencies, with the United States alone undertaking the free purchase and sale of gold at the

same time, the system permitted the United States to finance the chronic deficits in its balance of payments by issuing short-term debt to foreigners, who became increasingly reluctant to hold such claims.

The system was characterized by repeated foreign exchange crises as market participants anticipated that existing par values were unsustainable and shifted funds from a weak currency to a strong currency, exacerbating the domestic position for both currencies. Capital controls were imposed on outflows in the weak currency country and inflows in the strong currency country. The Germans, Japanese, and British regulated foreign borrowing and investment in their domestic capital markets and restricted repatriation of dividends. The Germans and Japanese tried to maintain undervalued marks and yen despite growing trade surpluses, and the British overvalued pounds despite persistent deficits. But to no avail. Ultimately market forces prevailed and the weak currency was devalued and the strong ones upvalued.

To alleviate drains on its gold reserves, the U.S. built a network of swap credits and issued "Roosa" bonds. Given the pegged exchange rates of the U.S. dollar and the unwillingness of the U.S. to accept domestic contraction to solve the problem of its balance of payments deficit, it

engaged in de facto exchange rate changes by actions to restrain capital outflows. This was the effect of U.S. enactment of the Interest Equalization Tax in 1964, made retroactive to the preceding year, and the imposition in 1965 of "voluntary" capital controls, made mandatory in 1968, and of other restrictive devices. Gold convertibility for U.S. foreign official dollar obligations effectively ended in 1968 with the replacement of the London gold pool by the two-tier gold market. The chronic deficit in the U.S. balance of payments and the unwanted accumulations of dollars by foreigners finally led to formal inconvertibility in 1971 and in that year and 1973 to formal devaluations of the dollar and then to generalized floating of foreign exchange rates.

The system of fixed but adjustable pegged exchange rates collapsed under the pressure of persistent deficits in the reserve center country's balance of payments that produced inflationary pressures on the rest of the world. The U.S. money supply grew at rates independent of the country's balance of payments position, contrary to the case under an international gold standard. Dollar reserve accumulations abroad, unless sterilized by the monetary authorities, expanded the monetary bases of our trading partners. U.S. relative price stability in the period until the mid-1960s that some members of the Gold Commission commented on

favorably at the September 18th meeting was viewed differently by foreign countries. According to them, the U.S. exported inflation to the rest of the world through its balance of payments deficits.

(3) Floating Exchange Rate System

Under the present floating rate exchange system, the dollar is still the main reserve currency and notwithstanding the use of other reserve currencies its use in the reserves of other countries has not declined. The former par value system, however, has been abolished by the Second Amendment to the Bretton Woods Articles of Agreement. The function of gold as the common denominator of exchange rates has been terminated. A member of the IMF may define its currency in terms of gold for domestic purposes but may not maintain the external value of its currency in terms of gold. There is no longer an official price for gold. There is no obligation on the part of members governing the price at which they may buy and sell gold, or to make payments to the IMF in gold. To restore the external value of the dollar in relation to gold would require an amendment of the Articles governing the IMF. Such an amendment would take effect only with affirmative votes of three-fifths of the members and members having 85 percent of the total voting power.

One difference between the present floating rate system and the Bretton Woods system is the gradual lifting of capital controls in the relatively free market economies. There is free access to the domestic credit markets for international traders and free repatriation of dividends. Another difference is the development of forward markets and currency futures contracts that enables firms engaged in foreign trade to protect themselves against currency fluctuations.

A case for the present system versus a fixed exchange rate system is based on a comparison of the size of adjustment costs from real shocks. Such a real shock, for example, occurred as a result of the increase in the price of oil, leading from 1974 on to a redistribution of international monetary reserves from oil-importing to oil-producing countries. Under fixed exchange rates, the domestic price level in oil-importing countries would have been subjected to a massive deflation. Under floating rates, some of the adjustment costs were absorbed by declines in external values of the currencies of those countries.

In the European Monetary System that was established in 1979 to limit exchange fluctuations among its member currencies, repeated adjustments of currency values have

occurred, the latest on October 4. Speculative pressures in foreign exchange markets against the French franc and the Italian lira and in favor of the German mark and the Dutch guilder compelled the latest realignment of currency values. In every case of realignment, the basic reason has been that the countries involved have been pursuing mutually inconsistent policies of money growth, and hence have been experiencing widely different inflation rates. A fixed rate system can operate successfully only if participants in it willingly accept the need to adopt domestic policies that result in price level movements that do not deviate from the average.

Foreign exchange crises have not characterized the floating exchange rate system. If the market judges a country's policies to be inflationary, it will set a low value on the external value of the currency, and conversely. Dirty floating by all evidence is costly to exchange and monetary authorities that attempt to oppose the market's verdict.

Under the present floating system, it is not strictly true that each country is free to adopt any domestic policy it chooses, unconstrained by international factors. In November 1978 and again in October 1979, our trading partners made known unmistakably that they were dissatisfied

with the decline in the external value of the dollar, and would not tolerate a further buildup of their dollar holdings in the absence of U.S. actions to reform its domestic economic policies. Nevertheless, countries with floating currencies are freer than those with fixed rate currencies to pursue policies that are regarded as in the national interest.

One option is for the United States to continue under the present floating rate system with improved discretionary control of the money supply. Inflation would be gradually eliminated as the growth rate of money declined to a stable noninflationary rate. Alternatively, the United States could adopt a gold standard unilaterally and remain on a floating exchange rate system. The objective of a unilateral gold standard would be to control the growth of the money supply. Those who favor such a course need to define the conditions under which such a system would work. Would nongold currency be convertible into gold coin or gold bullion, or would it be inconvertible, with gold reserve requirements imposed only to limit the monetary authority's discretion in issuing money? At what price would the government buy and sell gold?

Still other possibilities for the control of the domestic money supply include the imposition of a rule

governing the rate at which monetary authorities would increase the monetary base, or the institution of a competitive currency system, such as one member of the Commission has advocated.

These alternatives are not, however, the focus of the present memorandum. Rather, it seeks to determine which of the three possible international monetary arrangements each member would prefer.

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MEMORANDUM

To: Members of the Gold Commission
From: Anna J. Schwartz *AJS*
Subject: Draft of the Introduction to the Gold Commission Report
Date: November 19, 1981

Attached is a draft of the Introduction to the Gold Commission Report. The draft does not include recommendations on the role of gold that you are still to determine at the December 11 or subsequent meetings. The sooner you reach the determination, the sooner I can present a final version to you.

The Introduction outlines four chapters for the body of the report. If there are any objections to or revisions of the outline that you regard as desirable, it will be helpful to me to learn of them as soon as possible.

Report of the Gold Commission

Introduction

Establishment of the Commission

We, the members of the Gold Commission, were appointed by Secretary of the Treasury Donald T. Regan on June 22, 1981, pursuant to section 10(b) of Public Law 96-380 (31 U.S.C. 822a note), to "conduct a study to assess and make recommendations with regard to the policy of the U.S. Government concerning the role of gold in domestic and international monetary systems." The Commission was directed to transmit its report to Congress no later than October 7, 1981, 1 year after the date of enactment. Due to the change in administration and the delay in appointment of members, it was not until July 16, 1981, that we met for the first time. We were in general agreement that a satisfactory report could not be prepared by the October 7 date. Accordingly, we requested an extension of the Commission's life. Legislation to that end was introduced in the Congress in September 1981 and enacted on _____ The date for the report of the Commission was thereby changed to March 31, 1982.

Hearings on the Role of Gold

We held 9 meetings, 2 of which we heard testimony concerning gold from 22 witnesses. They commented on the use and effectiveness of gold in past domestic and international monetary systems, and offered varying proposals for a restored role for gold, or favored the continuation of the present system with no

role for gold.

In addition to arranging the hearings, the Treasury Department invited written statements on the role of gold from organizations and individuals. In an appendix to the Report, the testimony we heard and statements submitted to us are reproduced.

Contents of the Report

The body of our Report reflects the range of issues we discussed during our deliberations.

Chapter 1 surveys economic developments of recent years that were the background for the establishment of the Gold Commission. Shortcomings of economic performance since the mid-1960s occasioned the move by the Congress to provide for a study of the possible link between that outcome and the diminished role of gold of similar date in the domestic and international monetary system.

Chapter 2 examines the historical evidence on the experience of the United States with gold. In 1924, though legally on a bimetallic standard, de facto the United States adopted a gold standard. The chapter deals with successive changes since then in the character of our country's monetary system, down to the most recent decade of inconvertible paper money, and attempts to account for the changes.

In Chapter 3, we explore the strengths and weaknesses of alternative monetary standards, including different versions of a gold standard, commodity standards other than gold, and the

present inconvertible paper system. International aspects of the alternative standards receive attention.

In Chapter 4, we consider three possible recommendations regarding the role of gold in our country's monetary system:

1. The first one would make no essential change in the present role of gold but would provide for administrative matters, such as validating the public accounting for the gold stock; explaining the relationships between gold certificates held as an asset of the Federal Reserve System and the gold held by the Treasury; and improving the program of Treasury medallion sales. The recommendation would be consistent with the belief that an increase in the monetary role of gold is not now timely but the stock should be held as a reserve for possible future use, should a restored role for gold then appear feasible, or against other contingencies.

2. The second recommendation would reduce the role of gold. An example of a reduction would be a program of sales of official stock, either now held by the Treasury, or restored to it as part of a general distribution of gold to members by the International Monetary Fund. Sales could be in the form of bullion directly to the market, as in the case of the Treasury's auction sales in 1975 and 1977-79, or in the form of coin sales at variable market prices.

3. The third possible recommendation would be an increase in the role of gold. Such an increased role might take different forms. One would be the restoration of a gold reserve

requirement, without convertibility, to limit Federal Reserve issue of notes or bank reserves. Another form would be the restoration of a gold cover requirement with convertibility. In both forms, the foreign exchange value of the dollar would float, determined by the demand for and supply of dollars to settle international payments imbalances. The final form we consider would be the establishment of a classical gold standard. Under a classical gold standard, the government would be committed to purchase gold from the public on demand at a fixed price and to convert it into gold coin. Similarly, the government would be committed to sell gold to the public at the fixed price, the buying and selling prices differing by the cost of certifying and minting coins. The United States would establish a new parity for the dollar in terms of gold, and U.S. monetary liabilities would be linked to changes in U.S. gold holdings, produced by domestic or international factors.

For each form of an increase in the role of gold, we describe the main elements of the recommendation, transitional problems, if any, potential legal and international implications, and assess the advantages or disadvantages. For each form providing for a gold reserve, with or without the convertibility feature, a price of gold at which to value the reserve would need to be determined. This section concludes with a discussion of the problems raised in the choice of a price of gold.

Any recommendation of an increase in the role of gold must take account of the elements of the free market for gold that has

existed since 1968. In an appendix to Chapter II, we discuss several aspects of the demand for and supply of gold in the current gold market. In addition, the appendix provides a retrospective view on the record of gold production over past centuries, its relation to trend movements in commodity prices, and the allocation of the stock of gold between monetary and nonmonetary uses.

Majority and Minority Recommendations

Given the size of the Commission that the Congress mandated, and the diversity of our views, it became apparent to us during our deliberations that we would not be able to achieve a unanimous set of recommendations. It was gratifying, however, that common ground existed for a majority of us. We first set out the recommendations of those of us who form the majority, and then of the minority. Dissents in the body of the report reflect the division among us.

Even with respect to the majority, not every member if he had been reporting singly instead of as one of a body of colleagues would have expressed himself in precisely the way the recommendations are presented. Differences in wording, emphasis and perceptions would have been evident. For the sake of the presentation of a collective view, those of us forming the majority have muted our personal preferences.

[Majority and minority recommendations will be listed at this point in the introduction.]

Memorandum

To: Members of the Gold Commission
From: Anna J. Schwartz
Date: December 9, 1981
Subject: Proposed Statistical Appendix to the Gold Commission Report

Attached is an outline of the contents of a compendium of time series relating to gold that I propose to include in the Report of the Commission. A sample series is presented. If there are additional series that you would recommend be included, please let me know your suggestions as soon as possible. Would it be desirable to include the statistics on United States International Gold Trade, 1975-1981, that the Treasury has circulated?

The sample series happens to be the nominal and real price of gold annually since 1800. Congressman Paul's memo of November 30 on the subject of the price of gold makes the fortuitous selection of the sample series an appropriate one. The question of the meaning of the price of gold merits further discussion at the Commission's meeting.

Appendix A

STATISTICAL TABLES RELATING TO GOLD PRODUCTION, STOCKS,
SUPPLY AND DEMAND, AND THE NOMINAL AND REAL PRICE OF GOLD

CONTENTS

GOLD PRODUCTION

- A-1. Annual estimates of world gold production, 1800-1980
- A-2. Annual estimates of U.S. gold production, 1845-1980
- A-3. Average annual rates of change of world gold production and average annual rates of change of commodity prices, by subperiods, 1800-1980
- A-4. Geographical sources of world gold output, by subperiods, 1800-1980
- A-5. Shares of world gold output of leading gold producing countries, annually, 1968-1980

GOLD STOCKS

- A-6. Annual estimates of the world's total gold stock, 1800-1980
- A-7. Annual estimates of the world's monetary gold stock, inclusive and exclusive of private sector monetary gold holdings, 1807-1980
- A-8. Annual estimates of U.S. monetary gold stock, inclusive and exclusive of private sector monetary gold holdings, 1870-1980
- A-9. Annual estimates of the world's nonmonetary gold stock, 1807-1980

GOLD SUPPLY AND DEMAND

- A-10. Annual estimates of components of world gold supply, 1930-1952; 1950-1980
- A-11. Annual estimates of components of world gold demand, 1930-1952; 1950-1980

NOMINAL AND REAL PRICE OF GOLD

- A-12. Price of gold per ounce in nominal U.S. dollars and in 1967 U.S. dollars, annually, 1800-1980
- A-13. Price of gold per ounce in nominal U.S. dollars and in 1967 U.S. dollars, quarterly, 1968:II - 1980:IV

NOMINAL AND REAL PRICE OF GOLD

Table A-12

Price of Gold per Ounce in Nominal U.S. Dollars and in
1967 U.S. Dollars, Annually, 1800-1890

	Price of Gold Per Ounce in U.S. Dollars (1)	Wholesale Price Index 1967 = 100 (2)	Real Price of Gold (1) ÷ (2) (3)
1800	19.39	45.6	42.52
1801	"	50.2	38.63
1802	"	41.4	46.84
1803	"	41.7	46.50
1804	"	44.6	43.48
1805	"	49.9	38.86
1806	"	47.4	40.91
1807	"	46.0	42.15
1808	"	40.7	47.64
1809	"	46.0	42.15
1810	"	46.3	41.88
1811	"	44.6	43.48
1812	"	46.3	41.88
1813	"	57.3	33.84
1814	"	64.4	30.11
1815	"	60.1	32.26
1816	"	53.4	36.31
1817	"	53.4	36.31
1818	"	52.0	37.29
1819	"	44.2	43.87
1820	"	37.5	51.71
1821	"	37.5	51.71
1822	"	37.5	51.71
1823	"	36.4	53.27
1824	"	34.7	55.88
1825	"	36.4	53.27
1826	"	35.0	55.40
1827	"	34.7	55.88
1828	"	34.3	56.53
1829	"	34.0	57.03
1830	"	32.2	60.22

(continued)

Table A-12 (continued)

	Price of Gold Per Ounce in U.S. Dollars (1)	Wholesale Price Index 1967 = 100 (2)	Real Price of Gold	
			(1)	(2)
1831	10.20	33.2		60.22
1832	"	33.6		57.71
1833	"	33.6		57.71
1834	20.05	31.8		63.05
1835	20.60	35.4		58.45
1836	"	40.3		51.34
1837	20.67	40.7		50.70
1838	"	38.0		53.14
1839	"	39.6		52.20
1840	"	33.6		61.52
1841	"	32.5		63.60
1842	"	29.0		71.28
1843	"	26.5		78.00
1844	"	27.2		75.00
1845	"	20.4		70.31
1846	"	29.4		70.31
1847	"	31.8		65.00
1848	"	29.0		71.28
1849	"	29.0		71.28
1850	"	20.7		65.60
1851	"	20.4		70.31
1852	"	31.1		66.46
1853	"	34.3		60.26
1854	"	38.2		54.11
1855	"	36.2		57.10
1856	"	37.1		55.71
1857	"	30.3		52.60
1858	"	32.0		62.83
1859	"	34.0		60.70
1860	"	32.0		62.83
1861	"	31.5		65.62
1862	23.42	36.8		63.64
1863	30.01	47.0		63.85
1864	41.06	69.3		61.42
1865	32.45	65.4		40.62
1866	29.12	61.5		47.35
1867	29.57	57.3		40.86
1868	28.88	55.0		51.66
1869	27.40	53.4		51.48
1870	23.75	47.7		49.70

(continued)

Table A-12 (continued)

	Price of Gold Per Ounce in U.S. Dollars (1)	Wholesale Price Index 1967 = 100 (2)	Real Price of Gold (1) ÷ (2) (3)
1871	22.00	46.0	50.20
1872	22.22	48.1	48.30
1873	22.52	47.0	50.04
1874	22.00	44.6	51.55
1875	22.75	41.7	56.95
1876	22.05	38.9	50.25
1877	21.66	37.5	57.76
1878	20.84	32.2	64.72
1879	20.67	31.8	65.00
1880	"	35.4	58.39
1881	"	36.4	56.79
1882	"	38.2	54.11
1883	"	35.7	57.90
1884	"	32.0	62.83
1885	"	30.1	68.67
1886	"	29.0	71.28
1887	"	30.1	68.67
1888	"	30.4	67.99
1889	"	28.6	72.27
1890	"	29.0	71.28
1891	"	28.8	71.77
1892	"	26.9	76.84
1893	"	27.6	74.89
1894	"	24.7	82.68
1895	"	25.2	82.02
1896	"	24.0	86.13
1897	"	24.0	86.13
1898	"	25.0	82.68
1899	"	26.0	76.84
1900	"	28.0	71.52
1901	"	28.5	72.52
1902	"	30.4	67.99
1903	"	30.8	67.11
1904	"	30.8	67.11
1905	"	31.0	66.68
1906	"	31.0	64.80
1907	"	32.6	61.52
1908	"	32.5	62.60
1909	"	34.0	59.23
1910	"	36.3	56.04

(continued)

Table A-12 (continued)

	Price of Gold Per Ounce in U.S. Dollars (1)	Wholesale Price Index 1967 = 100 (2)	Real Price of Gold (1) ÷ (2) (3)
1911	20.67	33.5	61.70
1912	"	37.7	57.00
1913	"	36.0	57.42
1914	"	35.1	58.89
1915	"	35.9	57.58
1916	"	44.1	46.87
1917	"	60.6	34.11
1918	"	67.8	30.49
1919	"	71.5	28.91
1920	"	79.7	25.03
1921	"	50.4	41.01
1922	"	40.0	41.42
1923	"	51.9	39.83
1924	"	50.6	40.85
1925	"	53.4	38.71
1926	"	51.6	40.06
1927	"	49.3	41.93
1928	"	50.0	41.24
1929	"	49.1	42.10
1930	"	44.6	46.35
1931	"	37.6	54.97
1932	"	23.6	61.52
1933	26.44	24.0	77.76
1934	24.94	38.6	60.52
1935	25.00	41.2	64.75
1936	"	41.7	63.03
1937	"	44.5	78.65
1938	"	40.5	86.42
1939	"	39.8	87.04
1940	"	40.5	86.42
1941	"	45.1	77.61
1942	"	50.9	68.76
1943	"	53.6	65.30
1944	"	53.6	65.30
1945	"	54.6	64.10
1946	"	62.3	56.18
1947	"	76.5	45.75
1948	"	82.8	42.27
1949	"	78.7	44.47
1950	"	81.8	42.70

(continued)

Table A-12 (concluded)

	Price of Gold Per Ounce in U.S. Dollars (1)	Wholesale Price Index 1967 = 100 (2)	Real Price of Gold (1) ÷ (2) (3)
1951	35.00	91.1	38.42
1952	"	88.6	39.50
1953	"	87.4	40.05
1954	"	87.6	39.95
1955	"	87.8	39.86
1956	"	90.7	38.59
1957	"	93.3	37.51
1958	"	94.6	37.00
1959	"	94.8	36.92
1960	"	94.9	36.88
1961	"	94.5	37.04
1962	"	94.8	36.92
1963	"	94.5	37.04
1964	"	94.7	36.96
1965	"	96.6	36.23
1966	"	99.8	35.07
1967	"	100.0	35.00
1968	38.64	102.5	37.70
1969	41.12	106.5	38.61
1970	35.04	110.4	32.55
1971	40.81	113.0	35.83
1972	58.16	110.1	48.83
1973	97.32	134.7	72.25
1974	159.26	160.1	99.48
1975	160.00	174.0	92.00
1976	124.84	183.0	68.22
1977	148.11	194.2	76.27
1978	193.36	209.3	92.38
1979	307.82	235.6	130.65
1980	613.67	268.6	228.44

Source, by Column

1. 1800-1833: Coinage Act of April 2, 1792, which set weight of gold dollar at 24.75 grains of fine gold. 480/24.75 equals \$19.39 per ounce.
- 1834-1836: Coinage Act of June 28, 1834, which set weight of gold dollar at 23.2 grains of fine gold. 480/23.2 equals \$20.60 per ounce. For 1834, average of \$19.39 for the first half of 1834 and of \$20.60 for the second half of the year is \$20.05.
- 1837-1861; 1870-1932: Coinage Act of January 13, 1837, which set weight of gold dollar at 23.22 grains of fine gold. 480/23.22 equals \$20.67 per ounce.
- 1862-1878: \$20.67 times the premium on gold, in Wesley C. Mitchell, Gold, Prices, and Wages Under the Greenback Standard, University of California Press, 1908, p. 310.
- 1933: Average of monthly figures in G.F. Warren and F.A. Pearson, World Prices and the Building Industry, John Wiley, 1937, p. 179.
- 1934-1967: For 1934, average of January figure in source for 1933 and of \$35 for other months, the price derived from the Gold Reserve Act of January 31, 1934, which set weight of gold dollar at 13.71 grains of fine gold.
- 1965-1979: Annual averages of monthly figures in J. Aron & Company, Gold Statistics and Analysis, December 1979-January 1980, p. 76. For 1968-1969, the prices quoted are averages of the A.M. and P.M. London price fixings; for 1970-1974, P.M. fixings only; for 1975-1979, spot COMEX prices.
- 1980: Annual average of daily figures in Data Resources Incorporated database. The prices quoted are P.M. London price fixings.

Source (continued)

2. 1800-1890: U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 1, Series F-52, pp. 202-203, shifted from 1910-14 to 1967 base.
- 1800-1960: ibid., Series F-23, p. 199.
- 1971-1979: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, December 1980, Bulletin 2070, Table 140, p. 334.
- 1980: Survey of Current Business, August 1981, p. S-7, producer prices, all commodities.

U.S. Gold Stock 1944 - November 1981
(millions of fine troy ounces)

Year	Gold Stock		Net Sales or Purchasers			
	Outstanding end of period	Change during period	Foreign ¹⁾ Countries	Gold Pool	IMF	Domestic Producers & Consumers
1944	589.5					
1945	573.8	-15.7	-12.9	-	-	-2.8
1946	591.6	+17.8	+20.6	-	-	-2.8
1947	653.4	+61.8	+81.8	-	-19.6	-0.4
1948	697.1	+43.7	+43.1	-	-	+0.6
1949	701.8	+4.7	+5.5	-	-	-0.8
1950	652.0	-49.8	-49.3	-	-	-0.5
1951	653.5	+1.5	+2.2	-	-	-0.7
1952	664.3	+10.8	+11.3	-	-	-0.5
1953	631.2	-33.1	-33.3	-	-	+0.2
1954	622.7	-8.5	-9.3	-	-	+0.8
1955	621.5	-1.1	-1.9	-	-	+0.8
1956	630.2	+8.7	+2.3	-	+5.7	+0.7
1957	653.1	+22.8	+4.9	-	+17.1	+0.8
1958	588.1	-65.0	-65.5	-	-	+0.5
1959	557.3	-30.7	-28.5	-	-1.3	-0.9
1960	508.7	-48.7	-56.3	-	+8.6	-1.0
1961	484.2	-24.5	-27.5	-0.3	+4.3	-1.0
1962	458.8	-25.4	-21.3	-2.5	-	-1.6
1963	445.6	-13.2	-19.2	+8.0	-	-2.0
1964	442.0	-3.6	-12.3	+11.2	-	-2.5
1965	394.5	-47.6	-37.8	-	-6.4	-3.4
1966	378.1	-16.3	-13.9	-3.4	+5.1	-4.1
1967	344.7	-33.4	+2.9	-32.3	+0.6	-4.6
1968	311.2	-33.5	-6.0	-25.9 ²⁾	-0.1	-1.5 ²⁾
1969	338.8	+27.6	+27.3	-	+0.3	-
1970	316.3	-22.5	-18.0	-	-4.5	-
1971	291.6	-24.7	-24.1	-	-0.6	-
1972	276.0	-15.6	-0.1	-	-15.5	-
1973	276.0	-	-	-	-	-
1974	276.0	-	-	-	-	-
1975	274.7	-1.3	-	-	-	-1.3 ³⁾
1976	274.7	-	-	-	-	-
1977	277.6	+2.9	-	-	+2.9	-
1978	274.9	-2.7	-	-	+1.4	-4.1 ³⁾
1979	264.6	-10.3	-	-	+1.4	-11.7 ³⁾
1980	264.3	-0.3	-	-	-	-0.3 ⁴⁾
1981-Nov.	264.1	-0.2	-	-	-	-0.2 ⁴⁾
		<u>-325.4</u>	<u>-235.3</u>	<u>-45.2</u>	<u>-0.6</u>	<u>-44.3</u>

¹⁾ Official foreign monetary institutions.

²⁾ Sales through gold pool and to U.S. consumers ended March 18, 1968.

³⁾ Gold sold at public auctions.

⁴⁾ Gold sold in American Arts Gold Medallion Program.

Sources: Federal Reserve Bulletins, Annual Reports of the Director of the Mint.

U.S. Department of the Treasury
December 1981

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

269 MERCER STREET, 8TH FLOOR
NEW YORK, N.Y. 10003

MEMORANDUM

TO: Members of the Gold Commission

FROM: Anna J. Schwartz *AJS*

SUBJECT: Drafts of Chapters 1 and 2 of the Commission's Report

DATE: December 29, 1981

Attached are drafts of the first two chapters of the report. Chapter 2, except for minor revisions and the addition of notes, is essentially the chapter on U.S. experience with gold that I submitted to you in August. One change is the new figure of per capita real income, now expressed in 1929 prices. The figure that was included in the August draft was expressed in 1972 prices. That figure was constructed from annual data in 1929 prices for 1869-1975 that the Federal Reserve Bank of St. Louis spliced to a real per capita income series from 1950 on, expressed in 1972 prices. The figure was labeled real per capita income in 1972 prices. The correct way to have shifted the 1929-based series to a 1972 base would have been first to form a continuous series in current prices. After shifting the base of the implicit price deflator on a 1929 base to a 1972 base, the current price series should have been deflated by the 1972-based implicit price deflator. The series on a 1929 base is continuous, free of the problem that I believe marred the earlier figure.

The draft of Chapter 1 is preliminary. In particular, the computer-plotted figures that are included are not satisfactory. The scales have been badly chosen, so that it is not possible to distinguish the variables where more than one is plotted. The holiday season has interrupted the flow of computer-related services available to me. Improved versions of the figures will be submitted to you with the next draft of the chapter. I have included the figures, despite their imperfection, so that you would know what I intend to do in the chapter.

Chapter 1

Background to the Establishment of the Gold Commission

The legislation to create the Gold Commission in 1980 was a product of growing concern in many quarters in this country over the persistence and acceleration of inflation here for close to two decades. Many citizens believe that an expanded and restored role for gold in the U.S. monetary system is the solution to the problem of inflation, arguing that it will both restore monetary and fiscal discipline and reduce inflationary expectations.

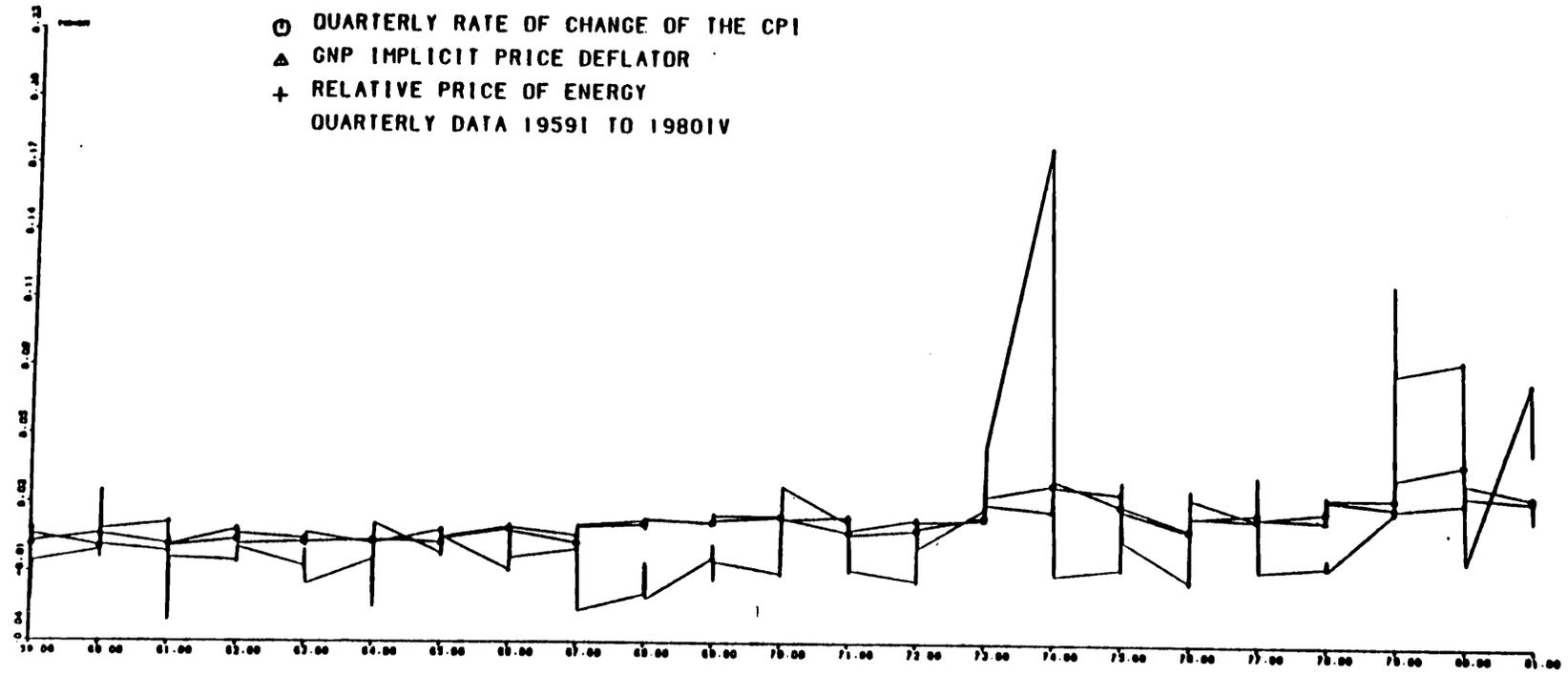
The Record of Inflation

Inflation may be defined as a sustained rise in the price level. It can be observed in the pattern of behavior of both the price deflator implicit in GNP and the consumer price index presented in Figure 1-1. The rate of increase in the deflator rose from less than 1 per cent per year in 1961 to 9 per cent in 1980, while the rate of increase in the consumer price index rose from 1 per cent to 11 per cent in the same period. The rate of increase was not steady but ratcheted upwards with fluctuations in economic activity.

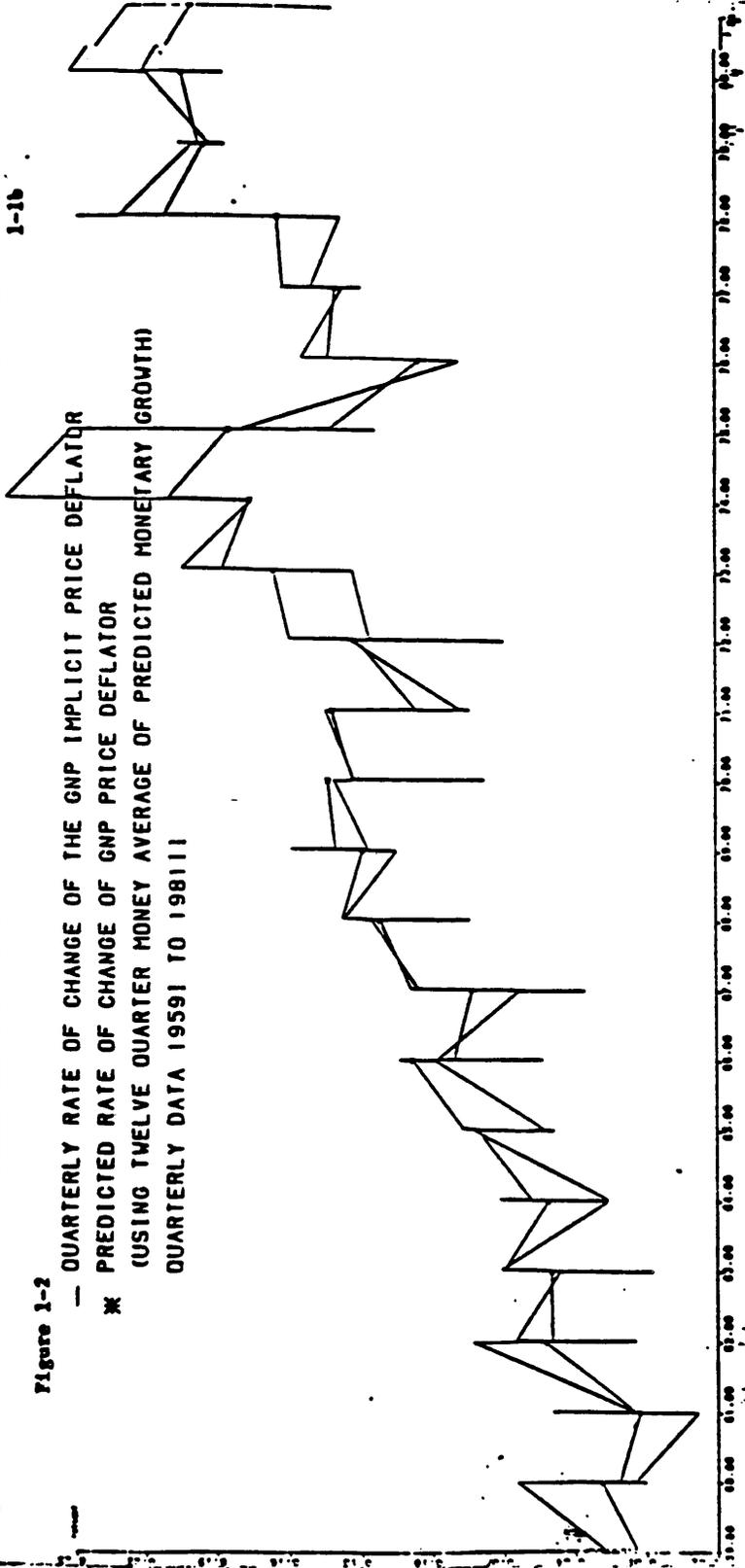
Many economists regard inflation as primarily a monetary phenomenon, explained by monetary growth in excess of the long-run trend of real output growth. They recognize, however, that other factors may temporarily affect the inflation rate independent of the rate of monetary growth. On Figure 1-2, the quarterly rate of inflation at annual rates, calculated from the

1-1

Figure 1-1



To be replotted.



To be reprinted.

index numbers for the deflator, are plotted together with the trend rate of inflation generated by a twelve-quarter moving average of lagged monetary growth.¹ A fairly close link between the two series may be observed, with the major exceptions of the years 1974-1975 and 1979-1980. Both of these episodes can be explained by the large rise in the real price of energy, defined as the annual rate of change of the producer price index of fuels and related products and power minus the GNP price deflator (see Figure 1-1). Though the inflation since the 1960s may be regarded as primarily a monetary phenomenon, it is still essential to account for the factors that produced excessive monetary growth as well as other independent sources of inflation.

Table 1-1 presents, on an annual basis, a number of relevant measures of economic performance crucial to an understanding of the development of U.S. inflation from 1960 to 1980. Columns 1-5 give the annual rates of growth of the money stock, defined as M1B, real GNP, the GNP price deflator, the CPI, and the real price of energy. Columns 6-11 give the annual unemployment rate, the Federal budget deficit as a ratio to GNP, the ratio of funds raised by the U.S. Government to total funds raised by the non-financial sector, the balance of payments surplus (deficit) on an official settlements basis, the dollar value of the U.S. monetary gold stock, and the trade-weighted dollar exchange rate (beginning 1967).

We begin by describing briefly six subperiods of the past two decades before turning to a more detailed examination of the

Table 1-1

Selected Economic Indicators, Annually, 1960-1980

Calendar Year	Annual Rate of Change (in percent)					Unemployment Rate (6)	Ratio of Federal Budget Surplus (Deficit) to GNP (7)	Ratio of Total Funds Raised by U.S. Federal Government to Total Nonfinancial Sector Funds (8)	Balance ^c of Payments Deficit(-) Surplus(+) (\$ millions) (9)	U.S. Monetary Gold Stock ^d (\$ millions) (10)	Trade-Weighted Exchange Rate of the Dollar (1972=100) (11)
	Real Output (1972=100)		Implicit Price Deflator (1972=100)		Real Price of Energy (1972=100)						
	MIB (1)	(2)	(3)	CPI (1967=100) ^a (4)	(5)						
1960	0.6	2.2	1.6	1.6	-0.6	5.5	0.6	n.a.	672	17,804	
1961	3.1	2.6	0.9	1.0	0.2	6.7	(-0.7)	15.4	-158	16,947	
1962	1.8	5.8	1.8	1.1	-1.9	5.5	(-0.9)	12.9	265	16,057	
1963	3.6	4.0	1.5	1.2	-1.5	5.7	0.1	6.9	-1,608	15,596	
1964	4.5	5.3	1.5	1.3	-4.2	5.2	(-0.5)	9.2	-1,489	15,471	
1965	4.5	6.0	2.2	1.7	-0.4	4.5	0.1	2.6	1,091	13,806 ^b	
1966	2.4	6.0	3.2	2.9	-0.7	3.8	(-0.2)	5.2	1,242	13,235	
1967	6.3	2.7	3.3	2.9	-0.8	3.8	(-1.7)	15.6	-5,874	12,065	119.96
1968	7.5	4.6	4.4	4.2	-5.5	3.6	(-0.7)	13.7	-3,048	10,892	122.06
1969	3.1	2.8	5.1	5.4	-3.2	3.5	0.9	-3.9	-2,480	11,859	122.39
1970	5.1	-0.2	5.4	5.9	-0.3	4.9	(-1.2)	12.6	-3,560	11,070	121.07
1971	6.3	3.4	5.0	4.3	3.2	5.9	(-2.0)	16.3	-23,813	10,206 ^e	117.81
1972	8.8	5.7	4.2	3.3	-1.3	5.6	(-1.4)	8.5	-9,769	10,487 ^f	109.07
1973	5.4	5.8	5.7	6.2	6.7	4.9	(-0.4)	4.1	-5,868	11,652 ^g	99.14
1974	4.2	-0.6	8.7	11.0	35.2	5.6	(-0.8)	6.2	-12,013	11,652	101.42
1975	4.7	-1.1	9.3	9.1	7.0	8.5	(-4.5)	40.5	-7,876	11,599	98.50
1976	6.3	5.4	5.2	5.8	2.9	7.7	(-3.1)	25.4	-20,251	11,598	105.63
1977	7.8	5.5	5.8	6.5	7.1	7.0	(-2.4)	16.8	-36,950	11,719	103.35
1978	7.9	4.8	7.3	7.7	-0.8	6.0	(-1.4)	13.4	-34,025	11,671 ^h	92.39
1979	7.1	3.2	8.5	11.3	15.2	5.8	(-0.6)	9.5	16,543	11,172	88.07
1980	6.2	-0.2	9.0	13.5	24.9	7.1	(-2.4)	21.6 ^b	-6,872	11,160	87.39

Notes to Table 1-1

^aYear-to-year percent change.

^bAverage of first three quarters seasonally adjusted data.

^cU.S. net official reserve assets minus net foreign official assets plus allocations of SDRs.

^dSee note a to Table 2-1 below.

^eSee note b to Table 2-1 below.

^fSee note d to Table 2-1 below.

^gSee note e to Table 2-1 below.

Source by Column

- 1-4, 6-9: Economic Report of the President, January 1981, Tables B-59, B-3, B-53, B-31, B-74 as ratio of B-1, B-62, B-99.
For Col. 8, before 1972, Economic Report, January 1979, Table B-62; February 1970, Table C-52.
For cols. 2 and 9, full year data for 1980, from Survey of Current Business, March 1981, pp. S-6 and 50, lines 38 and 57.
- 5: Federal Reserve Bank of St. Louis data bank.
- 10: Table 2-1 below.
- 11: Federal Reserve Bulletin 64 (August 1978): 200; 67 (October 1981): A-68.

salient factors that account for the persistence of inflation, despite recurrent attempts to curb it.

1. 1960-1964. This period was characterized by low monetary growth and, by historical standards, a low rate of inflation. It serves as a benchmark for the succeeding periods.
2. 1965-1970. The onset of steadily rising inflation in this period is generally associated with the financing of the Vietnam war and expanded Federal social programs. Neither the ratio of the Federal budget surplus or deficit to GNP nor the share of funds raised by the Federal Government seems particularly out-of-line with the record for 1960-1964. What does seem different from the earlier period is the stepped-up rate of growth of the money stock in 1967-1968 (Table 1-1, col. 1), suggesting that much of the war expenditure was financed by money creation. During the period 1965-1970, both monetary and fiscal policy were generally expansionary despite two significant attempts to reverse the inflationary process. Monetary growth was markedly reduced in 1966 in an episode commonly designated as "the credit crunch," and in 1969, a decrease in monetary growth was accompanied by a tax increase.
3. 1971-1973. In the belief that the inflation rate was slow in falling in response to the recession in business activity in 1970, the Nixon Administration sought a quick solution by resorting to direct controls on prices and wages in August 1971.

The policy was in effect for the next three years. Initially, wages and prices were frozen for ninety days. Subsequently, mandatory wage and price guidelines were imposed that were gradually relaxed.

The measured inflation rate declined in 1971 and 1972. There was satisfaction with the reduction in the inflation numbers. In retrospect, monetary growth was overexpansionary during these years and the first half of 1973. Consequently when the controls were eased in 1973, the pent-up excess demand quickly restored the inflation rate to its underlying trend rate.

4. 1974-1975. These unusual years were dominated by two sets of forces: contractionary money growth and an extraordinary rise in the real price of energy following the Arab oil embargo of 1973 (see Figure 1-1 and Table 1-1, col. 5). The supply shock raised the inflation rate well above the trend rate for the two years, substantially reduced real output growth, and raised the unemployment rate (Table 1-1, cols. 3 and 6).

5. 1976-1978. In reaction to the rise in the unemployment rate, unprecedented in the post-World War II period, the money growth rate was accelerated, and fiscal policy became generally expansionary. Once the effects of both the removal of price controls and the external energy supply shock had worked their way through economic processes, the inflation rate fell to its trend rate in 1976. In 1977 and 1978 the inflation rate moved up again.

6. 1979-1980. A further assault on the inflation problem in

1979 by means of monetary and fiscal restraint was thwarted by a second rise in the real price of energy. The effect of the energy price rise on the increase in inflation proved to be temporary. As of December 1981, the rate of inflation appears to be converging to the trend rate consistent with a policy of gradual reduction in monetary growth and contractionary fiscal policy.

Why the Setbacks to Success of Anti-Inflation Policies?

We now examine some of the reasons that explain the lack of success that has attended efforts since the mid-1960s to achieve a permanent reduction in the inflation rate.

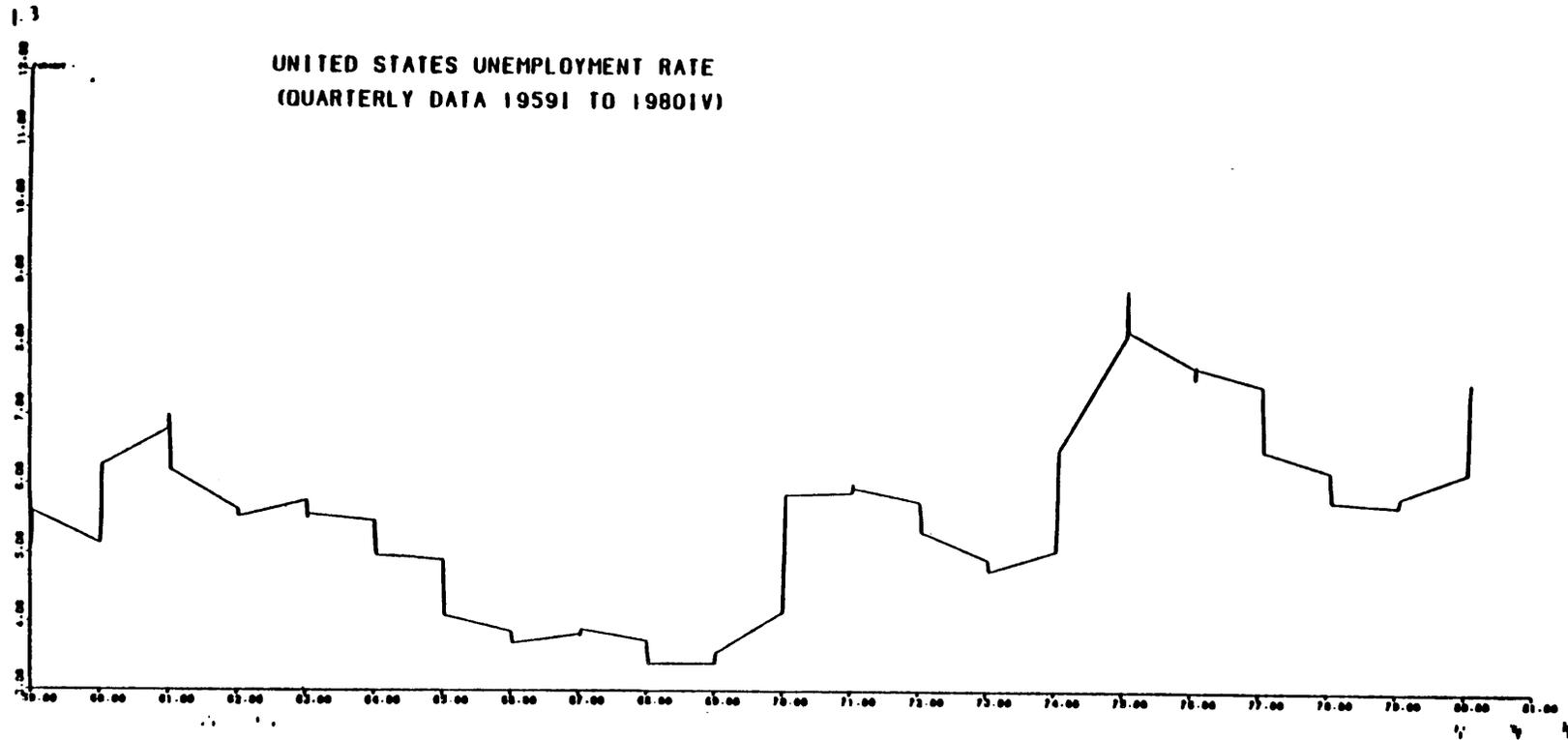
1. The Inflation-Unemployment Tradeoff. Hidden within the brief sketch of the events of the past two decades is a dilemma in the implementation of anti-inflation policies -- the so-called trade-off between inflation and unemployment. Empirical evidence supports the view that both monetary and fiscal policy have a lagged effect on economic activity measured in current prices. The initial effect of contractionary monetary policy is on the level of real output and the unemployment rate (within one to three quarters after the policy is in place). The effect is temporary. It is attributable to the lag in the adjustment of wage and price expectations and the inflexibility of contracts. The ultimate effect of contractionary monetary policy is on the price level and the rate of inflation. The time that elapses before the inflation rate is reduced, however, is measured in several years, not in several quarters.

Accordingly, attempts to reduce inflation by monetary means have quickly led to reduced real output growth and increased unemployment. These results have occasioned a reversal of the contractionary policy before it could succeed in significantly reducing the inflation rate. The pattern is observable following the reduction in monetary growth in 1969, which initially led to the recession in real output and rise in unemployment in 1970 (Figures 1-2 and 1-3). The contractionary policy was then reversed. A similar sequence occurred in 1974-1975, when contractionary monetary policy from mid-1973 and 1974 led in 1974-1975 to a dramatic decline in real output and a rise in unemployment, partly associated with the unexpected energy supply shock. The sequel for the next three years was an increase in monetary growth to levels not reached since 1973.

2. The Political Business Cycle. One reason sometimes offered to account for the failure of authorities to maintain a policy of restraint long enough to curb inflation is the proximity of elections.² In democracies, both monetary and fiscal authorities become highly sensitive to high unemployment and stagnant economic activity as elections approach. The temptation to manipulate the lags in the effect of policy may prove irresistible. It is possible to stimulate the economy by expansionary policies just before elections in the knowledge that inflation effects will not manifest themselves until afterwards.

The degree to which different administrations have in fact

Figure 1-3



manipulated the economy to win elections has not been incontrovertibly established. Public awareness of such behavior presumably would limit the incentive to engage in it. In the absence of widespread public understanding of the difference between the initial and ultimate effects of contractionary monetary policy, political pressures may be an important explanation of the temporary remissions in the inflation rate followed by reaccelerations to higher rates than prevailed before the anti-inflation actions were taken.

3. Sectoral Effects. The impact of anti-inflation actions falls disproportionately on certain sectors. Reduced provision of reserves to the banking system restricts the volume of loans to small business and the accompanying increase in interest rates restricts housing dependent on mortgage funds. If the response is expansion of Federal programs to alleviate the distress of small business and the mortgage market, anti-inflation actions are nullified.

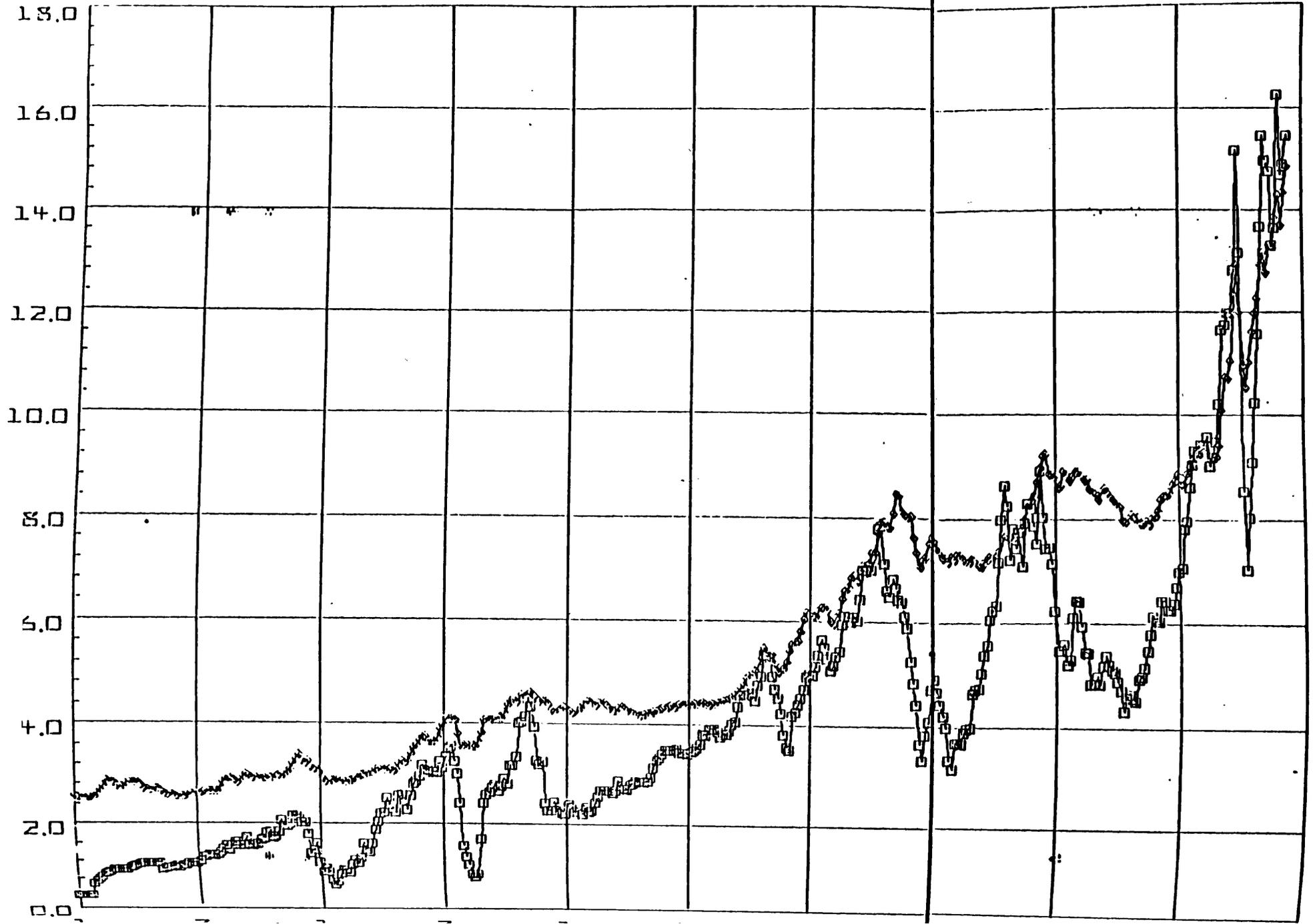
4. Inflationary Expectations. Inflationary expectations on the part of the private sector have been reinforced by the evidence of the past 15 years that inflation has only been temporarily reduced in response to contractionary policy. Hence, when a new round of contraction in monetary growth gets under way, the public may regard the new round as only temporary, as in past episodes, and not reduce their expectations of further inflation. The resistance of expectations to modification prolongs actual inflation.

Inflation expectations are believed to be incorporated rapidly and completely in asset prices. A comparison of Figures 1-1 and 1-4 reveals that movements in a long-term interest rate (the yield on AAA corporate bonds) over the whole period are closely associated with the trend rate of inflation. Short-term interest rates (such as the 90-day Treasury bill rate) are more volatile, reflecting both a negative response to short-term changes in monetary growth and a positive response to expected inflation. Since the freeing of the gold market in 1968, the price of gold has also served as a good barometer of market anticipations of inflation. As can be seen in Figure 1-5, its movements are volatile but closely related to the inflation rate.

To the extent that expectations of inflation are embedded in long-term contracts, both explicit and implicit, in labor and product markets, an attempt to reduce inflation by contractionary monetary growth must impose real hardship, at least until contracts can be adjusted. Yet the extent to which contracts will be renegotiated depends on whether the parties expect the policy to be enduring or quickly reversible.

5. Structural Changes. A number of structural changes in the economy, independent of or interacting with the rate of monetary growth, contributed to the difficulty of achieving positive results with anti-inflation actions. Four such changes are discussed: (a) Declining productivity growth; (b) Rising velocity; (c) Persistent Federal budget deficits; (d) Foreign

Figure 1-4

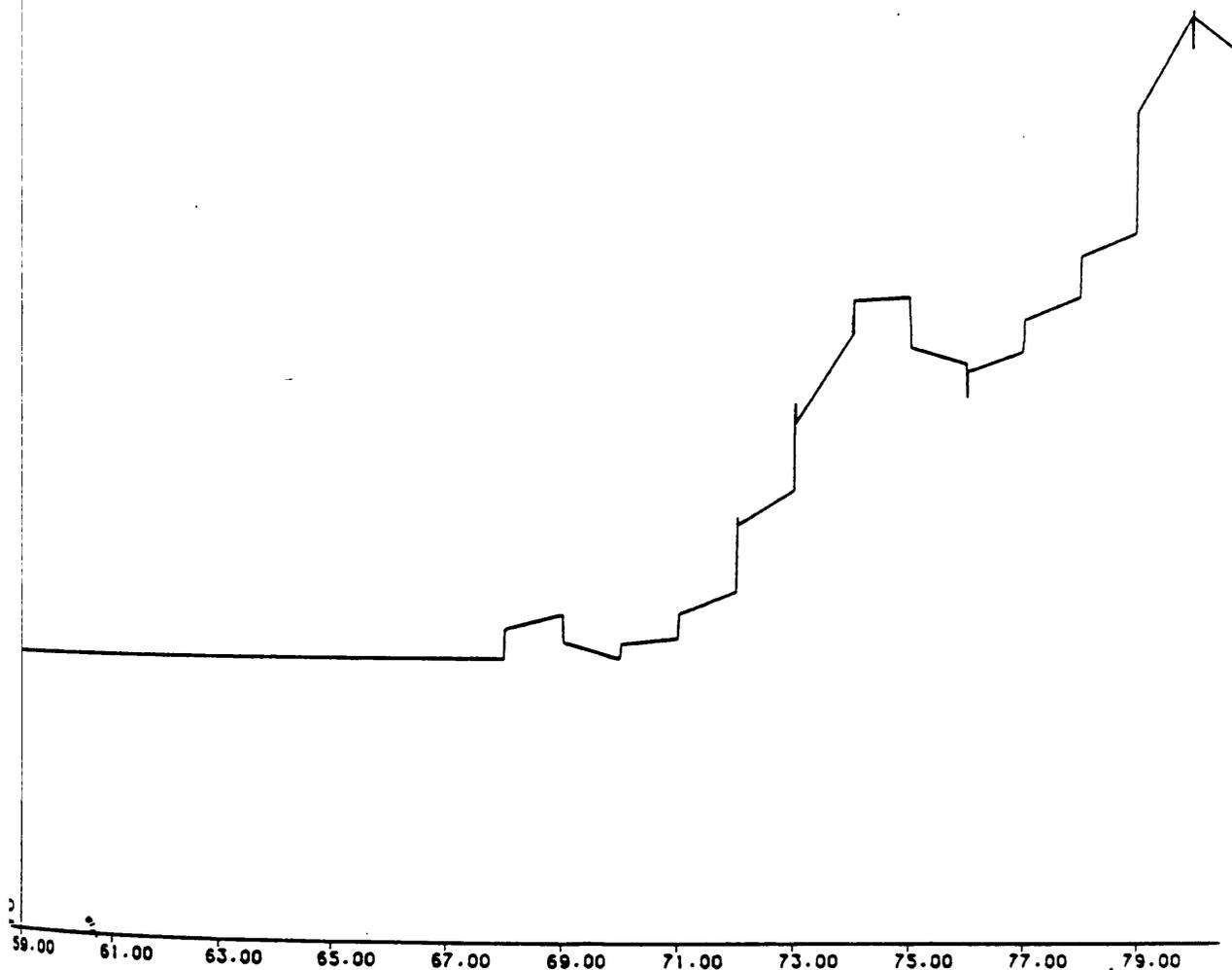


1-88

Figure 1-5

RATIO SCALE

PRICE OF GOLD 1959-1980
(QUARTERLY DATA 1959I TO 1980II)



influences on the open economy.

(a) Declining productivity growth. Output per manhour has declined in the United States (as it has in most industrialized economies) since the mid-1960s. Since reduced productivity growth implies a low trend real growth rate, a given rate of monetary growth will be associated with a higher rate of inflation.

(b) Rising velocity. The trend in income velocity of circulation of M1B (the ratio of GNP to the most widely used monetary aggregate) has been rising at slightly over 3 per cent per year since the late 1950s. The trend reflects the process of financial innovation, that is, the substitution of new types of payments media for currency and deposits. Because of this development, a given rate of monetary growth will be associated, other things equal, with a more rapid rate of inflation.

Inflationary expectations also tend to raise velocity. Although this phenomenon figures significantly during hyperinflations, it has not been significant during the past two decades.

(c) Persistent Federal budget deficits. Budget deficits hamper anti-inflation policies in two ways. They may cause an increase in monetary growth when the authorities finance the deficit by issuing new money. Alternatively, they may increase velocity when the authorities finance the deficit by selling government securities, competing directly with private users for private sources of funds and bidding up interest rates. (The drain of private sources of funds is commonly referred to as "crowding out.") The rise in market interest rates leads to a rise in

velocity and, for a given rate of monetary growth, a higher inflation rate.

Both effects have undoubtedly been present in U.S. history. A controversy exists in the literature on the relation between budget deficits and monetary growth.³ One channel emphasized in papers supporting such a link is the response of the Federal Reserve to increases in interest rates that deficits tended to produce. Under procedures that it has abandoned since October 1979, the Federal Reserve would increase monetary growth in the effort to limit interest rate variability. However, Table 1-1 shows that the ratio of the Federal budget deficit to GNP is not closely correlated with either monetary growth or inflation. In addition, the evidence for other countries does not support such a link. High deficit countries, such as Japan, have traditionally operated with low monetary growth rates. On the other hand, full employment deficits rather than actual budget deficits have been found to be closely linked to U.S. monetary growth.⁴ Higher government spending by itself, without regard to its effect on budget deficits, has also been linked to monetary growth.⁵

The connection between bond-financed deficits, rising velocity, and inflation is also not empirically established. Years of rapid inflation since the mid-1950s are not closely related to years when the financing the Federal budget pre-empted a large share of total financial funds.⁶

d. Foreign influences on the open economy. Under the Bretton Woods system, deficits in the U.S. balance of payments increased

in the 1960s. Initially, the deficits were regarded as satisfying a rising world demand for international reserves, since the dollar served as the world's principal reserve asset. As the deficits persisted, they were regarded less benignly as a reflection of excess monetary growth. Because the dollar served as the principal reserve asset in the post-World War II period, there was less pressure on the United States by her trading partners than might otherwise have been the case to respond to the persistent balance of payments deficits by monetary and fiscal restraint. Moreover, the deficits served to increase world liquidity and so transmit inflationary pressures on other countries that either voluntarily or involuntarily fell in step with U.S. inflation rates.

The decline in the U.S. monetary gold stock and in the gold reserve ratio against Federal Reserve notes by the later 1960s heightened fears abroad that convertibility of the dollar into gold was threatened, fears that culminated in runs on the dollar in 1967 and 1968, the establishment of the two-tier gold market in 1968, and the abandonment in August 1971 of the U.S. commitment to convert dollars held by official agencies into gold.

Thus rather than acting as a constraint on domestic inflation, the Bretton Woods fixed-exchange rate system did not do so and also served to transmit U.S. inflation abroad. Finally, when convertibility domestically and internationally conflicted with overall domestic policy goals, it was abandoned.

In 1971 and 1973, the dollar was devalued, and since

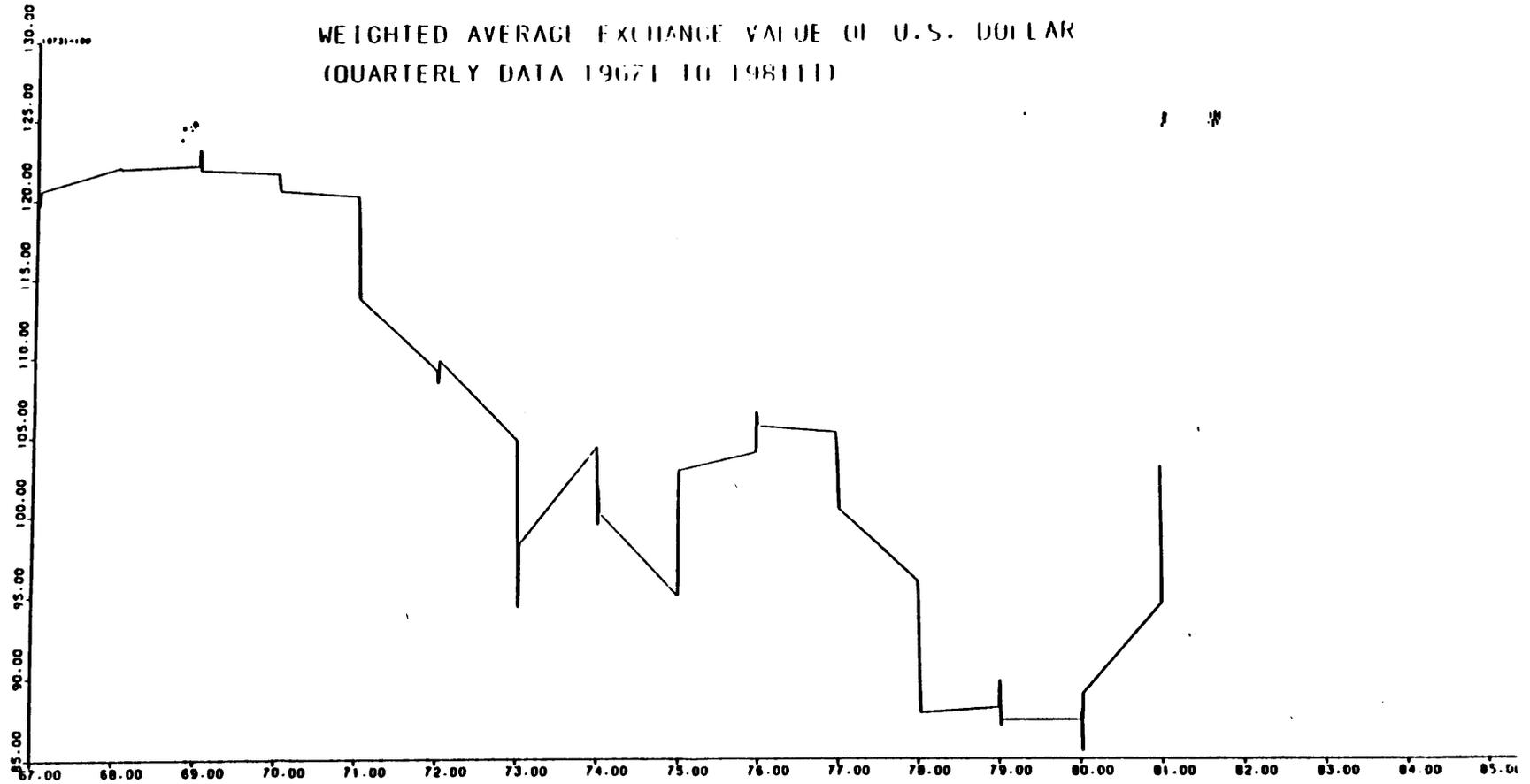
then, the exchange rate of the dollar has floated. Under a floating exchange rate system, the international economy provides even less of a constraint on domestic and monetary and fiscal policy. If a country has a more rapid inflation rate than the rest of the world, then the exchange rate, which can be viewed as a measure of the purchasing power of its money relative to that of other countries, will steadily depreciate. Indeed, this is precisely what happened to the foreign exchange value of the dollar after 1971 (Figure 1-6 and Table 1-1, col. 11).

Theoretical arguments have been made that under floating exchange rates foreign influences can still have effects on domestic prices and activity, independent of domestic policy. One view is that the world is characterized by high capital mobility, and a rise in interest rates in one center is rapidly transmitted to another so that velocity behavior is similar internationally. If high capital mobility were a fact, then assets denominated in different currencies would be perfect substitutes. This conclusion breaks down if assets, that is, bonds, are not perfect substitutes internationally because of risk with respect to exchange rate changes or to capital controls. With imperfect asset substitutability, there may be movements in relative national interest rates insulated from the rest of the world.

Another view is that independent monetary policy cannot succeed under floating exchange rates because of currency substitution, that is, an effort to restrict monetary growth domestically will be frustrated by the substitution of currencies issued

Figure 1-6

WEIGHTED AVERAGE EXCHANGE VALUE OF U.S. DOLLAR
(QUARTERLY DATA 1967 TO 1981)



by other countries. The argument is that the effect of reducing the growth rate of the domestic money stock is to impose a tax on domestic money holders, causing them to switch into holding foreign monetary assets including Eurodollars. Two problems undermine the argument. One is conceptual. The community is concerned with the real value of its money holdings -- what these will buy -- and receives a flow of real services from its real money balances. Thus a policy which reduces the rate of growth of the nominal money stock and the price level, leaving real balances constant, will not affect the flow of services from real money balances. The second problem is empirical, whether the existence of foreign currency deposits has had a significant impact on the demand for real money balances. While theoretically possible, empirical evidence in support of the view is mixed at best.⁷

Just as a floating exchange rate makes possible monetary independence, it can also insulate a country from domestic real shocks. Floating exchange rates cushioned the U.S. economy against the effects of the rise in oil prices in 1979-1980. The decline of 10 per cent in the exchange rate from 1972 to 1973-1975 (bridging the devaluation of the dollar and the start of flexibility) and again in 1979-1980 was a source of insulation, since the extent of the decline was greater than would be explained by the trend rate of inflation. Nevertheless, the foreign oil shock did temporarily raise the domestic price level. It did so through two channels. First, to the extent that the

rise in imported oil was not fully absorbed by the exchange rate, it had a direct effect on the domestic price level. Second, a depreciating exchange rate itself temporarily tends to raise the domestic price level by raising the price of imports in general. The effects are temporary until expenditure and production are directed away from the more expensive oil-intensive sectors of the economy.

Conclusion

The basic economic problem that has plagued the United States (and the rest of the world) since the mid-1960s has been the persistence and acceleration of inflation. We have reviewed the difficulties encountered by the U.S. monetary and fiscal authorities over this period in their successive attempts to pursue anti-inflation policies. The creation of the Gold Commission was an expression of dissatisfaction with the unsuccessful outcome of these past attempts.

To determine if greater success is possible in the future, it is important to advance proposals that can cope with the difficulties that have attended policymakers' past efforts in dealing with the problem of inflation. Our mandate is to conduct a study to assess the role of gold. To do so, we examine the historical record of U.S. experience with gold (Chapter 2), discuss different forms of the gold standard and alternative monetary standards (Chapter 3), and describe a host of proposals, some involving a role for gold, some not, that have been submitted to us as the means for achieving price stability (Chapter 4).

The test of the usefulness of these proposals is the extent to which they are immune to the kinds of pressures, noted in this chapter, that have prevented the achievement of a stable price level.

Notes to Chapter 1

1. The equation (in logarithms), for the period 1959:I to 1981:II, relating the quarterly change in the implicit deflator to a 12-quarter moving average of the quarterly change in money (defined as M1 for the years 1956-1958, thereafter as M1B) is:

$$\ln P_t - \ln P_{t-1} = \frac{-0.00208}{(-1.335)} + \frac{1.18871}{(9.682)} \frac{\ln m_t - \ln m_{t-1}}{12} - 1$$

$$\begin{aligned} R^2 &= 0.7669 \\ SEE &= 0.0034 \\ DW &= 2.081 \\ \rho &= 0.407 \end{aligned}$$

2. See W.D. Nordhaus, "The Political Business Cycle," Review of Economic Studies 42 (April 1975): 169-89; C.D. MacRae, "A Political Model of the Business Cycle," Journal of Political Economy 85 (April 1977): 239-63.
3. R.J. Gordon, "World Inflation and Monetary Accommodation in Eight Countries," Brookings Papers on Economic Activity (1977:2): 409-68; and W.A. Niskanen, "Deficits, Government Spending, and Inflation: What is the Evidence?" Journal of Monetary Economics 4 (August 1978): 591-602, dispute the validity of the link. W.D. McMillin and T.R. Beard, "The Short Run Impact of Fiscal Policy on the Money Supply," Southern Economic Journal 47 (July 1980): 122-35; and M.J. Hamburger and B. Zwick, "Deficits, Money and Inflation," Journal of Monetary Economics 7 (January 1981): 141-50, find a significant impact of deficits on monetary growth. Phillip Cagan holds that the nominal deficit expressed as a

percentage of GNP is overstated in real terms (see "The Real Federal Deficit and Financial Markets," The AEI Economist (November 1981): 1-3). This is so because interest payments on the Federal debt, which are reflected in the deficit, include compensation for the depreciation of the debt in real terms. Hence the deficit should be reduced by the product of the federal debt in private hands and the rate of inflation. Expressing the deficit minus the decline in the real value of the Federal debt as a percent of GNP reduces the nominal deficit considerably.

4. L.O. Laney and T.D. Willett, "Presidential Politics, Budget Deficits, and Monetary Policy in the United States: 1960-1976," Claremont Working Papers (1981).
The definition of the full (or high) employment budget has changed over time. The concept was designed to show what the surplus or deficit would be if the economy were moving along its potential growth path free of fluctuations in business activity.
5. R.J. Barro, "Comment from an Unreconstructed Ricardian," Journal of Monetary Economics 4 (August 1978): 569-81.
6. In the source cited in note 3 above (pp.3-5), Phillip Cagan adjusts the Federal budget deficit for the expected repayment of principal, on the assumption that the inflationary premium embedded in interest rates since the 1970s is equal to the depreciation in the value of the Federal debt due to inflation. On the further assumption that debt

holders regard these additional interest payments as a return of principal rather than as income and therefore not to be consumed, they will reinvest the additional interest to maintain the principal of debt intact. The reinvestment will finance, without crowding out, an amount equal to the depreciation in the real value of the debt.

7. Marc Miles, "Currency Substitution, Flexible Exchange Rates, and Monetary Independence," American Economic Review 68 (June 1978): 428-36, found evidence that currency substitution was significant for the Canadian demand for money. However, M.D. Bordo and E. Choudri, "Currency Substitution and the Demand for Money: Some Evidence for Canada," Journal of Money, Credit and Banking 14 (February 1982): forthcoming, find Miles's model to be misspecified and demonstrate that when the demand for money is properly specified, the influence of currency substitution (measured by expected changes in the exchange rate) is negligible. Bruce Brittain, "International Currency Substitution and the Apparent Instability of Velocity in Some Western European Economies and in the United States," Journal of Money, Credit and Banking 13 (May 1981): 135-55, found evidence for the significance of currency substitution for some countries but not for others.

Chapter 2

The Past Role of Gold in the U.S. Monetary System

From 1821 to 1973, with the exception of the years 1862 through 1879 and of an interlude of less than a year's duration in 1933-34, the United States adhered to some form of a gold standard. The purpose of this review is to examine the operation of the successive types of gold standard in U.S. experience (including for each type the evidence on the stability of the price level and of real output), as well as the intervening episodes of floating exchange rates.

Chronologically, U.S. experience with the gold standard may be characterized as follows:

1. 1821-1861: a de facto gold standard in a largely bimetallic international monetary system
2. 1862-79: the greenback standard
3. 1879-1914: a gold standard without a central bank, and a fractional reserve banking system, as part of an expanding international gold standard
4. 1914-1933: a managed gold standard, under the Federal Reserve System, which was legally obligated to maintain minimum gold reserves against its monetary liabilities, in a short-lived postwar international gold exchange standard

5. 1922-1928: a floating dollar in an international monetary system split between a depreciated sterling area and a gold bloc clinging to parity
6. 1928-1948: the interwar and World War II and immediate post-war managed gold standard, in a fragmented international monetary system
7. 1948-1968: the Bretton Woods dollar/gold standard system, with progressive dilution of the gold restraints on U.S. monetary conduct
8. 1968-1973: the breakdown of the Bretton Woods system
9. 1973-1981: the United States on an inconvertible paper dollar standard.

U.S. Experience on the Gold Standard

1. 1834-61 -- a de facto gold standard

Before 1879, the United States was legally on a bimetallic standard, but from 1834 on until the Civil War suspension of specie payments, de facto it was on the gold standard. The Mint ratio established by the Coinage Act of 1792 made the dollar equivalent to 24.75 grains of fine gold and to 371.25 grains of fine silver, or a ratio of 15 to 1.¹ The Mint ratio at that time

matched the market ratio. Subsequently, a great increase in Mexican and South American silver output led to a decline in the market value of silver relative to that of gold, the ratio approximating $15\frac{1}{2}$ to 1. Hence silver was overvalued at the Mint and relatively little gold was brought there. Instead, gold was shipped abroad where the price was higher. De facto during the period before 1834, the United United States was on a silver standard.²

On June 28, 1834, the Coinage Act of 1834 changed the Mint ratio to 16.002 to 1, lessening the weight of a dollar to 23.2 grains of fine gold and leaving unchanged the weight of a dollar of silver.³ Before 1834, 100 ounces of pure gold or 1500 ounces of pure silver in coin would discharge a debt. After 1834, the debt could be paid with 94 ounces of pure gold in coin. But since silver was undervalued at the Mint, it was driven from circulation. Offering 1475.5 ounces of silver was sufficient at the market ratio to obtain 94 ounces of gold. The Coinage Act in effect debased the currency. Some supporters of the Act were aware that it would drive silver out of circulation. It was indeed their objective to achieve a gold standard and a permanent circulation of gold coins. Others urged that as the value of silver relative to gold had been falling for many years before 1834, it would continue to do so in the future and therefore the

Mint undervaluation of the metal would soon be eliminated. That prediction was wrong.⁴

The Act of 1820 was supplemented in 1837 by a law changing the proportion of alloy to pure metal in gold to correspond to that in silver. It established the ratio of alloy at one-tenth, changing the quantity of pure gold from 23.2 to 23.22 grains.⁵ For each dollar weight in gold, there is a corresponding price of gold per fine troy ounce of 180 grains ($180/23.22 = 7.75$). The Mint ratio between silver and gold coins became 15.00 to 1 ($371.25/23.22$).

The gold discoveries in Russia, Australia, and California from 1848 on produced a fall in the value of gold, accentuating the discrepancy between the Mint and the market ratios. By 1853, a silver dollar was worth about 10% cents of a gold coin, so no one would use silver in settlement of debts. Silver was used as a commodity, not as money.⁶ Since subsidiary silver coinage was proportional to the weight of the dollar piece, it also disappeared from circulation. By 1850, there was a gold standard without adequate subsidiary money for retail transactions. The demonetization of silver may be dated from the Act of 1853, rather than the customary date of 1873. The Act reduced the number of grains of pure silver in 100 cents from 371.25 to 345.6, a reduction of nearly 7 per cent which exceeded the dif-

ference between the value of the gold dollar and silver dollar.⁷ The market value of the pure silver in subsidiary silver coins was thus less than the gold dollar (first minted in 1840; before then, only larger denominations had been coined).⁸ The face value of subsidiary coins accordingly was greater than their value in bullion. The supply of subsidiary coins was left to the discretion of the Secretary of the Treasury, and their legal tender limited to a sum not exceeding five dollars. The Act also for the first time imposed a charge for seigniorage, which until then had been an expense borne by the Government, although subsidiary coins were not subject to seigniorage. (The Resumption Act of 1875 repealed the charge.)⁹

The overvaluation of gold at the Mint that made the dollar a gold currency, when the United States was legally on a bimetallic standard, was reinforced by the gold discoveries after 1848. In France, also legally on a bimetallic standard from 1803 on, the circulation was almost exclusively silver since the market ratio was higher than the Mint ratio of 15½ to 1. When the gold discoveries after 1848 depressed the value of gold, as in the case of the United States, the divergence between the Mint and market ratios served to shift the franc to a gold standard de facto.¹⁰ Only Great Britain was on a full-fledged gold standard during the period after 1821, when convertibility was restored after the

Napoleonic Wars. Since Great Britain was the world's leading trading country and the London money market was the hub of international capital movements, the gold standard had international scope despite the limited number of countries formally adhering to it.

External and internal shocks interacted during the decade beginning 1820, resulting in a highly unstable performance by the U.S. economy. The chief external shock was British in origin. British eagerness to invest in the United States in the early 1820s necessitated a U.S. trade deficit, made possible by a rise in U.S. prices above those prevailing in Britain. Thanks to an inflow of specie into U.S. bank reserves, the money supply expanded, allowing U.S. prices to rise. (It is not clear that Andrew Jackson's war on the Second Bank of the United States had any independent consequences for monetary expansion.) Ultimately, loss of specie by the Bank of England led it in 1836 to restrain the capital outflow to the U.S. It raised the discount rate in July and August, refused to discount bills of exchange drawn on mercantile houses engaged in the Anglo-American trade, even at the higher rates, and as a result, produced financial pressure in the United States by early 1837.¹¹

Simultaneously with the earlier capital outflow from Britain, a surge in British demand for U.S. raw cotton triggered a land

boom. Between 1833 and 1836, land sales by the Federal Government at a constant price sextupled. News of the Specie Circular in July 1836, requiring payments to land agents in specie, concerned the Bank of England because of the implied rise in the demand for specie in the United States. Domestically, the planned distribution to the states in four equal installments (only three took place) of the surplus accumulated by the Federal Government from its land sales, starting January 1, 1837, might also have imposed a hardship on the banks as funds were transferred from one institution to another.¹²

Financial pressure in the United States in early 1837 was aggravated by a fall in the price of cotton, as British demand declined. As a result, debts secured by cotton became frozen, merchants holding such debts went bankrupt, and banks with such loans in their portfolios suspended specie payments as an alternative to the repayment of debts to Britain at a fixed exchange rate. In effect, the United States devalued the dollar during the period of suspension when foreign exchange was available only at a premium.¹³

The suspension continued for a year. In 1838, the economy revived when Britain resumed capital exports, but in 1839, loss of specie again prompted the Bank of England to raise the discount rate. As in 1837, both the supply of capital to the

United States and the demand for its cotton fell. The successor Pennsylvania-chartered Bank of the United States, which had extended loans on cotton when the price was high, suspended specie payments in October 1839, followed by banks in the South and West. Nine states defaulted on their bonded indebtedness in 1841 and 1842, shutting off further capital inflows from Europe until the 1850s. Bank failures were widespread, the supply of money fell sharply, and deflation ruled, 1839-43.

Banking panics also occurred in 1847 and 1857, but only the latter one was accompanied by restrictions on convertibility and a premium on gold.¹⁴

Gold standard experience of the United States before the Civil War was dominated by the role of the Bank of England. The standard imposed real adjustment costs on this country. External shocks produced boom and depression that further amplified the effects of internal shocks. Adjustment costs were the price the United States paid for maintaining a fixed exchange rate with sterling. When the costs became excessive, specie payments were suspended.

The record of the quarter-century from 1834 on reveals the magnitude of the adjustment costs. Wholesale prices at annual rates varied as follows:¹⁵

1834-37 (+8 per cent); 1837-43 (-7 per cent); 1843-47 (+5 per

cent); 1847-49 (-5 per cent); 1849-55 (+5 per cent); 1855-61 (-4 per cent).

The estimates of real output for the period 1834-59 are not continuous with the post-Civil War estimates.¹⁶ At annual rates, they also suggest not much greater stability than in wholesale prices:

1834-36 (-1 per cent); 1836-39 (+6 per cent); 1839-40 (-1 per cent); 1840-53 (+6 per cent); 1853-54 (-4 per cent); 1854-59 (+4 per cent).

2. 1862-1872 -- the greenback standard¹⁷

Early in 1862, convertibility of Union currency into gold was suspended as a result of money creation in the North to help finance the Civil War, disturbances in foreign trade, the general uncertainty arising out of the war, and the borrowing techniques of the Treasury. From then until resumption of specie payments on January 1, 1879, the United States was legally on a fiduciary standard -- the greenback standard. Despite support for inconvertible currency by many business groups before and during the war, and growing farm support after the war, as agricultural prices fell, suspension of payments was generally regarded as temporary.

During suspension, greenbacks circulated side by side with gold, with the price of gold in terms of greenbacks varying from

day to day. A floating rate of exchange existed between the two currencies. The major monetary use of gold was for foreign transactions. For foreign payments, gold was equivalent to foreign exchange, since Great Britain in particular maintained a gold standard. Dealers as well as others having extensive foreign transactions therefore found it convenient to maintain gold balances as well as greenback balances. To accommodate them, New York banks, and perhaps others as well, had two kinds of deposit accounts: the usual deposits payable in greenbacks or their equivalent, and special deposits payable in gold. The gold deposits were expressed in "dollars" like the greenback deposits, but the dollar stood for the physical amount of gold that had corresponded to a dollar before the Civil War and was to again after 1879. During the period of suspension, this physical amount of gold was worth more than a dollar in greenbacks -- it was worth well over two dollars in greenbacks from mid-1864 to early 1865.

Gold also retained an appreciable, though minor role, in domestic payments. Customs duties were payable in gold. In addition, the Treasury made virtually all interest and principal payments on its debt in gold at the pre-Civil War monetary value. Some private debt instruments required payment of interest or principal in gold. Finally, the West Coast remained largely on a

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specie basis. In the rest of the country, prices were quoted in greenbacks, and gold offered in payment was valued at its current market premium in greenbacks. On the West Coast, by contrast, prices were quoted in gold, at the prewar parity, and greenbacks offered in payment were valued at their current market discount in gold.

Before the Civil War, the exchange rate between the U.S. dollar and the British pound varied around \$4.86 within a narrow interval determined by the costs of shipping gold. From 1862 on, the exchange rate was not so limited and moved far outside those limits. It was determined by the demand for and supply of foreign exchange, and there were no legal commitments on the part of the United States that prevented the exchange rate from taking any value that was necessary to balance international payments.

The essential requirement for a return to the prewar parity was that the exchange rate so determined be within the initial range determined by the gold points. Once the Civil War was over, the most important factor affecting the exchange rate between the U.S. dollar and the British pound was the movement of internal prices in the United States relative to prices in Britain. A drastic decline in U.S. prices between 1867 and January 1879 made resumption possible. The price index fell at the rate of 5.4 per cent per year. Over the same period, the

quantity of money rose at the rate of 1.3 per cent per year. An exceedingly rapid rise in output was the primary factor producing the decline in prices.

Specie resumption was a major political objective of the period and the question whether the government was proceeding toward this objective too rapidly or too slowly was a major political issue. Government action played a minor, if crucial, supporting role in contributing to successful resumption. It may have contributed to the rapid expansion of output through its policies on sale of public land, land grants to railroads, and other similar measures which contributed to the expansion of the West. But such government action was not of the kind that anyone at the time or since would have regarded as explicitly directed toward achieving resumption.

Government action had mixed effects on the mild rate of growth of the quantity of money outstanding. On the one hand, federal and state legislation laid the foundation for the rapid growth of commercial banking, particularly state banks after 1867, that produced increases in the ratios of deposits to reserves and deposits to currency. In addition, the elimination of reserve requirements against national bank notes in 1874 liberated reserves that encouraged a rise in the deposit-reserve ratio. The rises in the deposit ratios tended to increase the quantity of

money outstanding, and thereby to inhibit price declines and to postpone the achievement of the prerequisites for successful resumption. On the other hand, the government did succeed in bringing about a minor reduction in the stock of high-powered money, mostly through use of government surpluses and debt refunding operations to retire Civil War currency issues from 1865 to 1869, and it thereby helped offset to a limited extent the effect of the rises in the deposit ratios.

In view of the recurrent political pressures to expand the greenback issues -- to which the government in fact yielded in 1873-74 -- and the political difficulty then as now of obtaining budget surpluses to retire debt, the achievement of even a minor decline in high-powered money was not a negligible accomplishment.

The Resumption Act of January 14, 1875, which announced the intention to resume specie payments at the prewar parity on January 1, 1879, contained a variety of provisions designed to appeal to silver advocates (replacement of fractional currency -- a Civil War paper issue -- by silver coins); paper-money advocates (removal of existing limits on the aggregate issue of national bank notes and linking the retirement of greenbacks -- the aggregate outstanding not to fall below \$300 million -- to the increase in national banknotes; for every five dollar

increase in national bank notes the Treasury was to retire four dollars in greenbacks); gold standard advocates (its main provisions). The Act authorized the Secretary of the Treasury both to use surplus revenue and to sell bonds in order to accumulate a gold reserve. At the time, the Act was little more than the expression of a pious hope and, insofar as it had any contemporary effect, it was to heighten the opposition to resumption.

That opposition was reflected in the free silver movement that arose in the mid-1870s. The Monetary Commission that was formed late in 1876 by a joint resolution of the Congress presented a year later one majority and two minority reports. The majority argued against resumption as "not practicable under the circumstances, until the laws making gold the sole metallic legal tender are repealed." Some of the majority recommended the old silver dollar of 412.5 standard (equivalent to 371.25 grains of fine silver) grains; the rest recommended a legal relationship between silver and gold of 15.5 to 1 instead of the old relationship of 15.98 to 1, achievable either by reducing the silver content of the silver dollar to 399.9 grains or by increasing the gold content of the gold dollar. They favored the former inflationary effect. One minority report rejected silver as unsuitable for a standard of value but recommended devaluation of the gold dollar by about 2.6 per cent. The second minority

report supported the principle of silver remonetization only on condition that an international conference would accept silver as a universal legal tender.¹⁸ There was clearly a range of views on the proper monetary standard, with some diehard attitudes toward resumption at the pre-Civil War parity. Late in 1877, the House passed a bill to repeal the Resumption Act. The bill was defeated in the Senate by one vote. This paper-thin decision turned out to be politically decisive.

The decline in the quantity of money in the last few years before resumption, which helped foster the particularly rapid price decline of those years, in part owed something to the decline in the two deposit ratios associated with bank suspensions in 1877-78, in part to the influence of the Resumption Act. The interpretation of the clause in the Resumption Act requiring a proportionate withdrawal of greenbacks for new national bank notes served to contract the greenback circulation because the voluntary surrender of national bank notes issued by banks retiring their notes was not deducted from the gross increase by other banks.¹⁹

Both before and immediately after resumption, the Treasury in its refunding operations went to great lengths to avoid the introduction of even temporary disturbances of any magnitude in the foreign exchange market. In 1877-79, the Treasury refunded

about half the average outstanding interest-bearing public debt, to take advantage of lower rates of interest. For foreign holders of securities, calls of old bonds were so timed that one collection of securities was replaced by another or, if offsetting sales of new bonds were not possible, surplus from current account was available to pay for old bonds retired without export of U.S. gold. During these years, in fact, the United States was a net importer of over \$5 million in gold, despite a repatriation of over \$300 million of U.S. government securities by foreigners.

The Resumption Act, and the borrowing and accumulation of a specie reserve under its provisions, had three effects, working in different directions, on resumption.

1. Insofar as the Act and the specie reserve instilled confidence in the prospective maintenance of specie payments, it inhibited either a speculative withdrawal of funds from the United States or a speculative accumulation of specie, and enhanced the willingness of foreigners to hold U.S. dollar balances. Had there been no Resumption Act, repatriation by foreigners of U.S. securities in 1876-78 might well have been even greater than it was. More important, by setting a definite exchange rate that was to be attained and a definite date at which it was to be attained, the Act offered those speculators

with confidence that the government would in fact succeed in achieving those aims an incentive to proceed so as to hold it there. In fact, the monthly average premium on gold dropped below 2 per cent by March 1878 and never thereafter rose above that level. This effect clearly favored resumption.

2. The sale of bonds was an open market operation. The sale of bonds at home for gold was equivalent to selling bonds for greenbacks and then using the proceeds to purchase gold, with the effect of an open market purchase combined with an equivalent open market sale, the two together leaving the total monetary base unaffected. In practice, though gold was not the legal standard, it was used for monetary purposes alongside greenbacks. In consequence, insofar as the gold purchased came from gold held for monetary purposes by either the domestic public or the domestic banks, it did, in the first instance, reduce the reserve basis of the system. However, the banks and others could always replace gold holdings, if they so wished, by purchasing gold or its equivalent, sterling, in the free market at home or abroad and, in fact, that is what happened. The increase in the Treasury's gold reserves was not appreciably at the expense of the high-powered money holdings of the public or the banks.

3. Since gold was the equivalent of foreign exchange, the Treasury's purchase of gold constituted an increase in the demand

for foreign exchange. Insofar as it borrowed abroad resources that would otherwise not have been available for loans to this country, it increased the supply correspondingly. But some of its borrowing abroad must have been at the expense of other lending to this country (lending was going on even though the net capital movement from this country was outward); to that extent, the supply was increased less than the demand even by foreign borrowing. Borrowing at home had this effect to an even greater extent. By borrowing at home, the Treasury acquired resources that would have been used in other ways, some of which might have involved a demand for foreign exchange. At most, however, only part of the resources would have been used to purchase foreign exchange, whereas the Treasury used all of them in this way. The result of the greater increase in demand than in supply was to make the greenback price of sterling higher than it otherwise would have been. The effect therefore made resumption more difficult; it required, that is, a decline in domestic prices sufficient not only to balance foreign payments on current account at the desired exchange rate but also to produce a large enough surplus to finance the accumulation of the specie reserve. Whether the Resumption Act on balance hindered or helped resumption therefore depends on whether this effect was more or less important than the effects on confidence and speculation, and on

the growth of high-powered money.

Whatever the conclusion on this score, the cessation of government borrowing to build up a gold reserve, once resumption had taken place, removed a source of pressure on the exchange rate and permitted domestic prices to rise sharply immediately after resumption, without producing balance-of-payment problems.

3. 1870-1914 -- a gold standard without a central bank²⁰

The success of resumption did not end uncertainty about the monetary standard. For nearly two decades thereafter, the U.S. financial scene was dominated by controversy, which had started in the seventies, over the place of silver in the monetary system.

The rapid expansion of output in the Western world during those decades and the adoption of a gold standard over an area far wider than before added substantially to the demand for gold for monetary purposes at any given price level in terms of gold. That expansion in demand more than offset a contemporary expansion in supply, as a result both of increased production of gold and improvement of financial techniques in erecting a larger superstructure of money on a given base of gold. The result was a slow but rather steady downward tendency in product prices that prolonged and exacerbated the political discontent initiated by the rapid decline in prices after the end of the Civil War.

"Greenbackism" and "free silver" became the rallying-cries. The silver forces were strong enough to obtain concessions that shook confidence in the maintenance of the gold standard, yet they were not strong enough to obtain the substitution of silver for gold as the monetary standard. The monetary history of this period is therefore one of repeated crises and of legislative backing and filling.

The political campaign of 1896 on these issues was conducted with notorious bitterness involving both class and sectional conflicts. Fear and smear techniques were used freely on all sides. The free-silver advocates succeeded in capturing Democratic state conventions and in maneuvering the adoption of a free-silver plank in the Democratic national convention, which chose William Jennings Bryan as candidate. The National Silver party and the People's party -- an agrarian party -- deflected from its extensive reform program by the hope of victory on the silver issue, also nominated Bryan. A Conservative Democratic group seceded, held an independent convention, and nominated its own candidate (John M. Palmer). The Republican party nominated McKinley who was persuaded to accept along with the nomination a platform favoring the gold standard until "international agreement with the leading commercial nations of the earth . . . can be obtained" for coining gold and silver at a fixed ratio. A

rump group seceded from that convention and went over to the Democrats.

The election was won by the Republicans, largely, it has been claimed, because the farm vote swung to the party as a result of the rise in price and quantity of farm-product exports during the fall of 1896. Once the party was in power, Republican political action for monetary reform was restrained. Bryan's strength at the polls, however, compelled the Republicans to keep a campaign promise to propose another international conference in Europe to remonetize silver. The defeat of the silver inflationists had improved the United States' bargaining position, but by that time, rising gold output had snatched from the silver advocates the chance of achieving an international bimetallic standard. Not until March 14, 1900, however, was the Gold Standard Act passed. It declared the gold dollar to be the monetary standard of the country and prescribed a reserve of \$150 million in the Treasury for the redemption of paper money.

The defeat of William Jennings Bryan in the Presidential election of 1896 marks in retrospect the end of the period. His defeat hapened to follow gold discoveries in South Africa and Alaska and the perfection of the cyanide process for extracting gold. These developments produced a rapid expansion of the world's production of gold. Bryan's second defeat in the

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Presidential election of 1900 sealed the doom of silver as a major issue dominating national politics. The gold standard had finally triumphed in the United States. The price reversal, which farmers had sought to achieve with silver, was produced after 1907 by the prodigious increase in the international supply of monetary gold. It was sufficiently large to force an upward price movement over the next two decades despite a continued growth in world output. The "money" issue retreated from the center of political controversy. The gradual rise in prices rendered the gold standard secure and unquestioned in the United States until World War I.

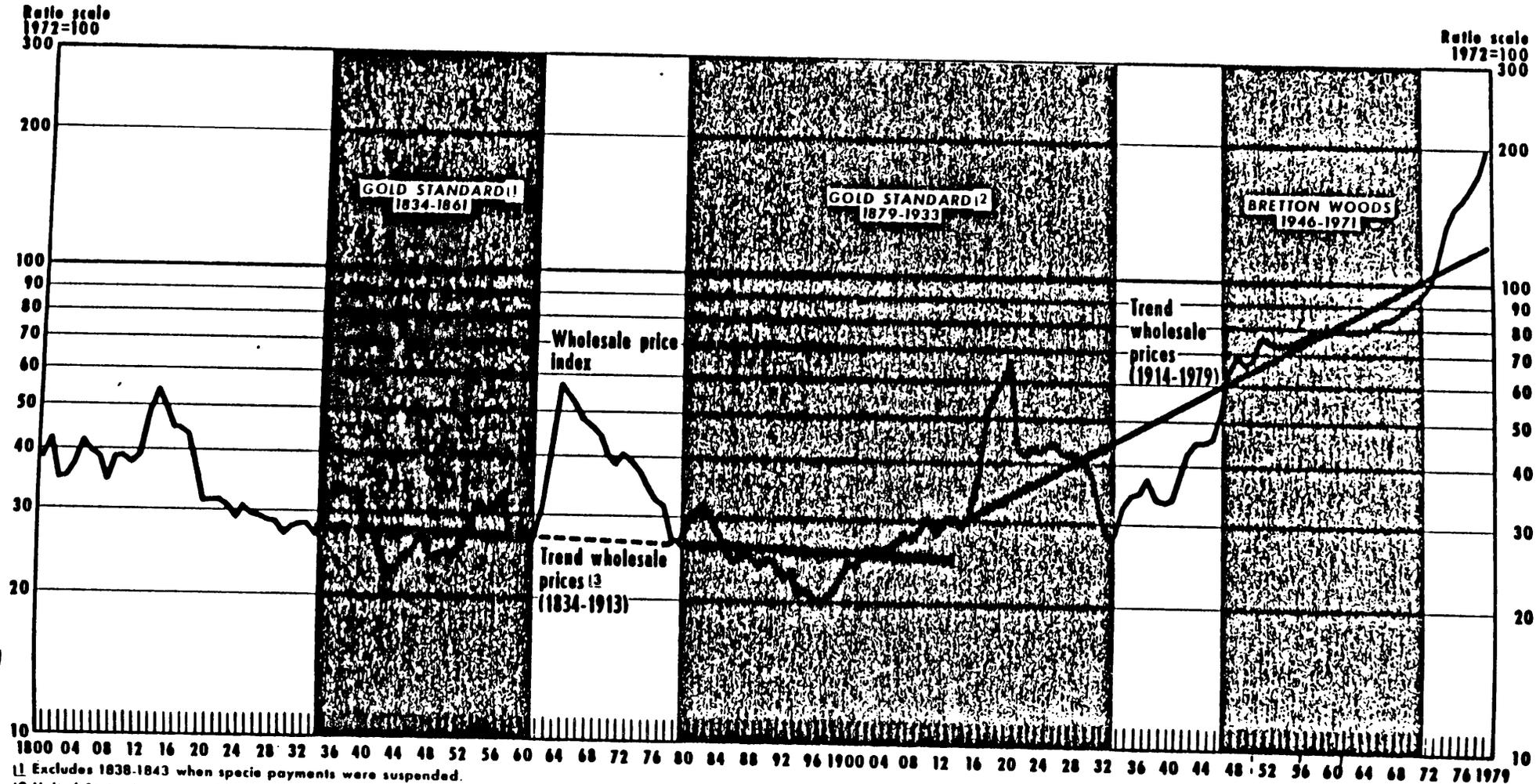
Monetary disturbances during the period from 1879 to 1914 were associated with banking difficulties in 1884, 1890, 1893, and 1907. Under a fractional reserve banking system, the public's withdrawal of currency from the banks not only reduced the banks' reserves but also produced a multiple contraction in deposits. In some episodes, as in the period 1834-1861, the banks restricted convertibility of deposits into currency. As a consequence, currency sold at a premium, which was equivalent to a depreciation of the deposit dollar in terms of gold or foreign exchange. These monetary disturbances, however, were attributable to the U.S. banking structure rather than the gold standard system, as was clear from the case of banking difficulties in

1873. The need for reform of the banking structure was widely acknowledged after 1907.

To form a judgment about U.S. experience under the gold standard, we can examine the behavior of prices and real per capita output (Figures 2-1 and 2-2) and of the monetary gold stock and the purchasing power of gold (Figure 2-3). (Figures follow on pp. 2-23a, 2-23b, 2-23c.) The trend of the wholesale price index for the period 1834-61 and 1879-1914 was slightly downward, with a marked degree of variance about the trend.²¹ Despite a sharp decline in the annual estimates from 1890 to 1896, the trend of the U.S. monetary gold stock was positive from 1879 to 1914.²² The trend of the purchasing power of gold was positive (a falling price level) from 1879 to 1896, negative (a rising price level) from 1897 to 1914, reflecting the more rapid growth in U.S. monetary gold than in real output in the later period. Deviations from trend in the monetary gold stock were negatively associated with deviations from trend in the purchasing power of gold, with some tendency for the purchasing power deviations to lead the monetary gold stock deviations. This would be consistent with a tendency for the price level to revert towards a long-run stable value under the pre-World War I gold standard, though over the short run inflation or deflation was experienced.

As might be expected, the trend of U.S. real per capita income

Figure 2-1
Wholesale Price Index, United States



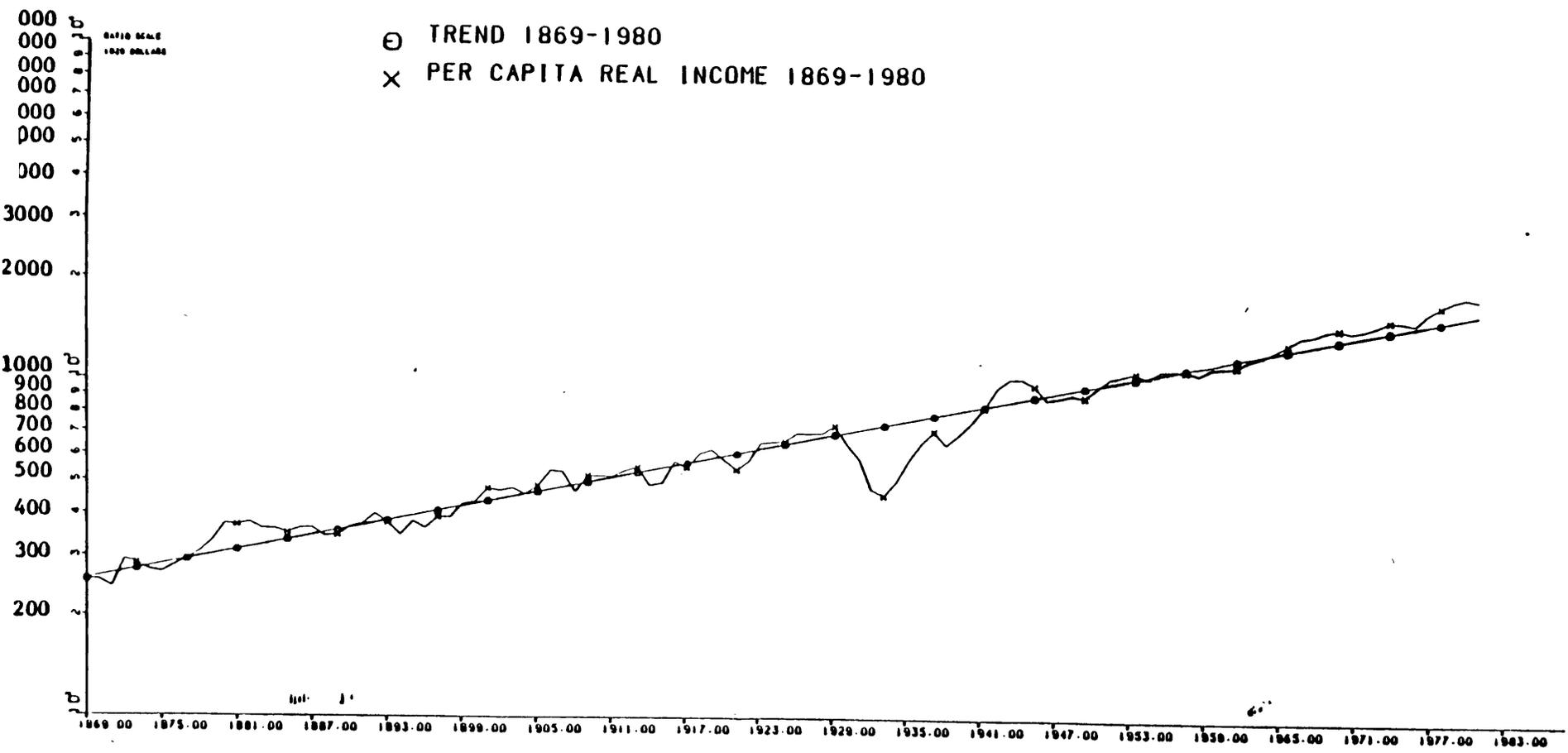
[1] Excludes 1838-1843 when specie payments were suspended.

[2] United States imposes gold export embargo from September 1917 to June 1919.

[3] Broken line indicates years excluded in computing trend.

REAL PER CAPITA INCOME

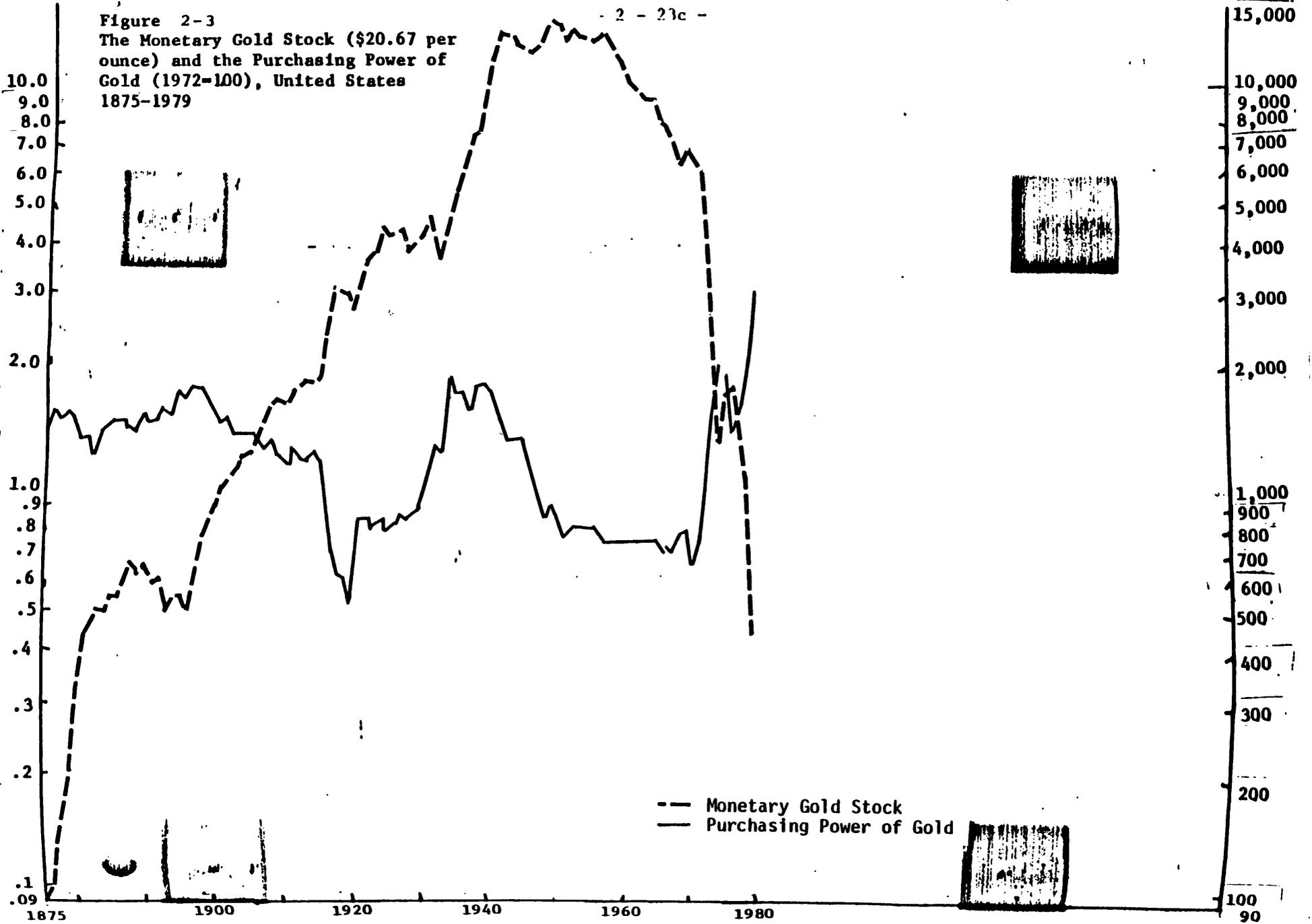
FIGURE 2-2



Index Number

Millions of \$

Figure 2-3
The Monetary Gold Stock (\$20.67 per ounce) and the Purchasing Power of Gold (1972=100), United States 1875-1979



-- Monetary Gold Stock
— Purchasing Power of Gold

was strongly positive from 1870 to 1914, but with substantial variance about the trend.²³

In sum, contemporaries regarded the pre-World War I gold standard as a successful commodity standard, international in scope from the late nineteenth century on. It provided long-run stability despite short-term price instability. Years might elapse before a tendency to decline or rise in the price level was reversed. Real output growth around a rising trend was not steady but the instability was attributed to special features of the U.S. banking structure.

Relative to Great Britain, the United States was only a small country in the world economy. The Bank of England dominated the world economy, influencing international flows of capital, managing the gold standard on a narrow gold base, so that the rest of the world had to keep in step with its actions. With the monetary systems of many countries linked together through fixed exchange rates, international payments imbalances led to movements in money supplies, price levels, the relative prices of exports and imports, incomes and interest rates.

The extent to which these results were due to relative international peace, relatively free international trade, factor mobility within and across countries, the concentration of world capital and money markets in London, and the willingness of gold

standard countries to maintain fixed parities can be judged by comparison with the absence of these conditions in the post-World War I decades.

11. 1913-1933 -- a managed gold standard²⁴

The Federal Reserve Act was passed in 1913 under peacetime conditions when it was taken for granted that the gold standard would prevail. The Act included a gold standard rule incorporated in gold reserve requirements for Federal Reserve notes and deposits and also a "real bills" rule, according to which the criterion for determining the quantity of money would be linked to "notes, drafts, and bills of exchange arising out of actual commercial transactions" (section 13), offered for discount at rates to be established "with a view of accommodating commerce and business" (section 14). Both were regarded as quasi-automatic in their operation. Taken literally, the two rules were contradictory. Maintenance of the gold standard means that the stock of money must be whatever is necessary to balance international payments. The real bills rule sets no effective limit to the quantity of money.

The Act was no sooner passed than the conditions taken for granted ceased to hold. Before the System began operations in

November 1914, World War I had begun. Very soon the belligerents effectively left the gold standard and a flood of gold started coming to the United States to pay for purchases by the Allies.

Between September 1917 and June 1919 the United States controlled gold exports by export licenses and in effect suspended interconvertibility between paper money and gold. The gold standard criterion set a largely ineffective limit on the total quantity of money. A worldwide gold standard was re-established for a brief period in the 1920s, yet the gold standard never again played the role that the framers of the Act took for granted. The real bills criterion fared no better. Once the United States entered the war, loans on government securities began to rival commercial paper as collateral for Reserve Bank rediscounts. The Reserve System was authorized to issue notes against rediscounted assets other than commercial paper, mainly members' 15-day notes secured by government bonds. Thus the Federal Reserve System began operations with no effective legislative criterion for determining the quantity of money.

This conclusion can be documented by comparing the actual course of events with what would have happened under a fully operative gold standard. The wartime experience under a gold standard might not have differed from what actually occurred: the large inflow of gold up to the entry of the United States

into the war would have produced a price rise through 1918 similar to actual experience. The big difference would have emerged between the end of the war and 1920 when nearly half of the monetary expansion from 1914 on occurred because the Federal Reserve subordinated monetary policy to the alleged necessity for facilitating Treasury funding of the floating debt plus unwillingness to see a decline in the prices of government bonds. The monetary expansion and the accompanying inflation led to an outflow of gold after the lifting of the embargo despite the great demand abroad for U.S. exports and despite the departure of most countries from a fixed parity between their currencies and either gold or the dollar. The ensuing decline in the reserve ratio of the Federal Reserve System finally compelled action to slacken monetary growth. The initial action -- a sharp rise in discount rates in January 1920 -- produced a reversal of the gold outflow in May. The following action -- a second rise in discount in June 1920 rates to the highest level in Federal Reserve history until 1973 -- was a deliberate act of policy involving a reaction stronger than was needed, since a gold inflow had already begun. It was succeeded by a heavy gold inflow and a negative rate of monetary growth over the following year. Wholesale prices were nearly halved by June 1921 from their level in May 1920. Real output fell precipitously.

The postwar increase in the quantity of money occurred because the Reserve System did not observe the rules of the gold standard but exercised discretion. The subsequent collapse occurred because the power to manage money was not limited by the requirement to maintain gold reserve requirements. Had there been no discretion, neither the postwar increase, nor the postwar collapse need have occurred.

The price and output movements of the post-World War I years in this country were part of a worldwide movement. Throughout most of the world, for victors, vanquished, and neutral alike, prices rose sharply before or into 1920 and fell sharply thereafter. About the only countries that escaped the price decline were those that were to experience hyperinflation. Though many national currencies were not rigidly tied either to gold or to the dollar, central bank policies nevertheless produced linkages sufficiently strong to result in common movements of prices in most national currencies. Flexible exchange rates were regarded as a temporary expedient pending return to gold, and monetary authorities everywhere sought to facilitate such a return to fixed parities. The results under managed fiduciary currencies were therefore similar to those that would have been experienced with fixed parities.

During the balance of the 1920s, the Federal Reserve System

did not permit gold movements to affect the quantity-of money outstanding. Inflows were offset by open market sales, outflows, -by open market purchases. Federal Reserve credit after 1923 moved inversely with movements in the gold stock. The System achieved stable economic growth with falling wholesale prices, but this achievement was largely at the expense of economic stability in Great Britain and the peripheral countries tied to sterling. Britain's return to gold in 1925 at a parity that overvalued sterling would have caused her less difficulty if prices in the United States had risen instead of falling thereafter. The United States would then have gained less gold or lost some, and the pressure on the pound would have been eased. When France returned to gold in 1928 at a parity that undervalued the franc and also did not permit gold inflows to affect its money stock and prices, the British position was further undermined.

The monetary standard to which most countries had returned by 1920 was the gold-exchange standard. They kept their monetary reserves in the form of balances of other currencies convertible into gold at fixed prices, notably sterling and dollars, rather than in the form of gold itself. Official agencies in such countries, usually the central banks, often fixed exchange rates directly by standing ready to buy or sell the national currency at fixed rates in terms of other currencies, rather than

indirectly by standing ready to buy or sell gold at fixed prices in terms of the national currency.

Since the gold-exchange standard, like the gold standard, involved fixed exchange rates, it also meant that, so long as the standard was maintained, prices and incomes in different countries were intimately connected. They had to behave so as to preserve a rough equilibrium in the balance of payments among countries. The gold-exchange standard, however, made the international financial system more vulnerable to disturbances because it raised the ratio of claims on gold available to meet those claims.

The links forged by fixed rates of exchange ensured a world-wide decline in income and prices after 1929. The evidence is clear that the United States was in the van of the movement and not a follower. If declines elsewhere were being transmitted to the United States, the transmission mechanism would be a balance of payments deficit in the United States as a result of a decline in prices and incomes elsewhere relative to prices and incomes in the United States. That decline would lead to a gold outflow from the United States which, in turn, would tend -- if the United States followed gold-standard rules -- to lower the stock of money and thereby income and prices in the United States. However, the U.S. gold stock rose during the first two years of

the 1929-33 contraction and did not decline, demonstrating that other countries were being forced to adapt to our monetary policies rather than the reverse.

The international effects were severe and the transmission rapid, not only because the gold-exchange standard had rendered the international financial system more vulnerable to disturbances, but also because the United States did not follow gold-standard rules. The Federal Reserve did not permit the inflow of gold to expand the U.S. money stock. It not only sterilized it, it went much further. The U.S. quantity of money moved perversely, going down as the gold stock went up. In August 1929, at the start of the business contraction, the U.S. quantity of money was 10.6 times the gold stock; by August 1931, it was 8.3 times the gold stock. The result was that other countries not only had to bear the whole burden of adjustment but also were faced with continued additional disturbances in the same direction, to which they had to adjust.

The effects first became severe in those countries that had returned to gold with the smallest actual gold reserves, and whose financial structure had been most seriously weakened by World War I -- Austria, Germany, Hungary, and Rumania. To shore up the financial systems of those countries, international loans, in which the Reserve System participated, were arranged. But so

long as either the basic pressure on those countries, deriving from deflation in the United States was not relieved, or the fixed-exchange rate link which bound them to the U.S. dollar was not severed, such assistance was at best a temporary palliative. In country after country, that is what it proved to be. As they experienced financial difficulties, the United States was in turn affected by the reflex influence of the events it had set in train.

The first major country to cut the link was Britain, after runs on sterling precipitated by France and the Netherlands. Britain abandoned the gold standard in September 1931. The international monetary system split in two, one part following Britain to form the sterling area; the other following the United States, in the gold bloc. The trough of the depression in Britain and in other countries that accompanied Britain in leaving gold was reached in the third quarter of 1932.

In the two weeks following Britain's departure from gold, central banks and private holders in a number of foreign countries converted substantial amounts of their dollar assets in the New York money market to gold. The U.S. gold stock declined by the end of October to about its level in 1929. The Federal Reserve System, which had not responded to an internal drain from December 1930 to September 1931 as a series of runs on banks,

bank failures, and shifts from bank deposits to currency by anxious depositors produced downward pressure on the U.S. quantity of money, responded vigorously to the external drain.

sharp rise in discount rates ended the gold drain temporarily but intensified bank failures and runs on banks. In 1931, unlike the situation in 1920, the System's reserve ratio was far above its legal minimum. The System overreacted to the gold outflow and magnified the internal drain.

The Federal Reserve System justified its passivity in relation to the internal drain by reason of a shortage of free gold. The law specified that the System hold against Federal Reserve notes outstanding, the volume of which had increased with the internal drain, a reserve of 40 per cent in gold and additional collateral of 60 per cent in either gold or eligible paper (which consisted of commercial, agricultural, or industrial loans, or loans secured by U.S. government securities rediscounted by member banks; loans to member banks secured by paper eligible for rediscount or by government securities; and bankers' acceptances, i.e., "bills bought" in Federal Reserve accounting terminology). Because the System did not have enough eligible paper to furnish 60 percent of the collateral for Federal Reserve notes, part of the gold in excess of minimum requirements had to be pledged for this purpose. The amount of gold not needed to meet either mini-

minimum gold requirements or collateral requirements was therefore less than the amount of excess gold reserves. The Federal Reserve System asserted that the shortage of free gold was an important factor preventing the System from engaging in open market purchases. Such purchases would have reduced eligible paper holdings still further by reducing rediscounts and therefore could have been conducted only to a very limited extent without eliminating free gold entirely. Whatever the validity of the Federal Reserve view, the Glass-Steagall Act of February 27, 1932, disposed of that problem by permitting government bonds in the Reserve Banks' portfolios as well as eligible paper to serve as collateral against Federal Reserve notes in addition to the 40 per cent minimum gold reserve.

The downward movement of money, income, and prices in the United States was reversed for a few months in the second quarter of 1932, when the Federal Reserve finally undertook a program of open market purchase, following which there was a widespread revival in the real economy in the summer and fall. The termination of the program during the summer was followed in the six months from October 1932 by mounting banking difficulties, leading to state banking holidays. By February 1933, fears of a renewed foreign drain added to the general anxiety. For the first time, also, the internal drain partly took the form of a

specific demand for gold coin and gold certificates in place of Federal Reserve notes or other currency. The Federal Reserve System reacted as it had in September 1931, raising discount rates in February 1933 in reaction to the external drain but not seeking to counter either the external or internal drain by extensive open market purchases. In the first few days of March, heavy drains of gold, both internal and external, reduced the New York Federal Reserve Bank's reserve percentage below its legal limit. With some reluctance, the Federal Reserve Board suspended reserve requirements for thirty days. On March 4, the Federal Reserve Banks remained closed as did all the leading exchanges. A nationwide banking holiday was proclaimed after midnight on March 6 by the incoming administration. All banks were closed until March 9 and gold redemption, gold shipments abroad or dealing in foreign exchange were suspended during the bank holiday. The Emergency Banking Act of March 9, 1933, granted the President emergency powers over banking transactions and over foreign exchange dealings and gold and currency movements. The next day, March 10, the President issued an executive order extending the restrictions on gold and foreign exchange dealings beyond the banking holiday proper and, in effect, prohibiting gold payments by banking and nonbanking institutions alike, unless permitted by the Secretary of the Treasury under license.

These measures were the precursors to a far-reaching alteration in the legal structure of the monetary standard.

1933-1934 -- a floating dollar²⁵

Despite the effective suspension of gold payments in March 1933, the price of gold or the rate of exchange between the dollar and currencies that remained rigidly linked to gold, hovered around "par" for over a month. The suspension was regarded as part of the banking emergency and hence expected to be temporary; foreign exchange transactions were strictly controlled and limited; the administration made no official announcement that it proposed to permit the dollar to depreciate or be devalued; and after some weeks, several licenses to export gold were granted. Moreover, the technical gold position was sufficiently strong so that there was little doubt the preceding gold parity could have been maintained if desired; the ratio of the gold stock to the total stock of money was higher than at any time since 1914.

One important step, unprecedented in the United States, was taken during this period. On April 5, an executive order forbade the "hoarding" of gold and required all holders of gold, including member banks of the Federal Reserve System, to deliver their holdings of gold coin, bullion, or certificates to Federal

Reserve Banks on or before May 1 except for rare coins, reasonable amounts for use in industry and the arts, and a maximum of \$100 per person in gold coin and gold certificates. The gold coin and gold certificates were exchanged for other currency or deposits at face value, and the bullion was paid for at the legal price of \$20.67 per fine ounce. The "nationalization" of gold outside Federal Reserve Banks was later completed by order of the Secretary of the Treasury, dated December 28, 1933, excepting only rare coins and a few other minor items from the requirement that all gold coin, gold bullion, and gold certificates be delivered to the Treasurer of the United States at face value corresponding to the legal price of \$20.67 per fine ounce. The expiration date for the surrender of gold was later set as January 17, 1934, when the market price of gold was in the neighborhood of \$23 per fine ounce.

An executive order of April 20, 1933, extending and revising the gold embargo, and comments by the President at his news conference the preceding day ended the period of stability in the price of gold. The President made it clear that the administration intended to permit the dollar to depreciate in terms of foreign currencies as a means of achieving a rise in domestic prices. The order applied the restrictions on foreign exchange transactions not only to banks licensed under the executive order

of March 10, but also to all persons dealing in foreign exchange. On the same day, the Thomas amendment to the Agricultural Adjustment Act was offered in Congress. The amendment enacted into law on May 12, and explicitly directed at achieving a price rise through the expansion of the money stock, contained a provision authorizing the President to reduce the gold content of the dollar to as low as 50 per cent of its former weight. The dollar price of gold immediately started rising, which is to say that so also did the dollar price of foreign currencies, including those like the French franc that remained on gold and those like the pound sterling that had gone off gold at an earlier date. In the next three months, the market price of gold rose to \$30 an ounce, and thereafter fluctuated erratically between a low of about \$27 and a high of nearly \$35 until January 30, 1934, when the Gold Reserve Act was passed. During that period, the United States had a floating exchange rate determined in the market from day to day, as in the period from 1862 to 1879. However, there was considerably greater government interference in the market. On September 8, 1933, an official gold price, to be fixed daily at the estimated world market figure less shipping and insurance cost, was established. The Treasury agreed to buy gold at that price to give American miners a price as high as they could have obtained by export in the absence of the export embargo.

Starting in October, the government intervened actively to raise the price of gold. The Reconstruction Finance Corporation was authorized to buy newly mined domestic gold from October 25 on, and a few days later, through the agency of the Federal Reserve Banks, to buy gold abroad. The purchase price was raised almost daily. For a time, the large-scale PFC purchases abroad made the announced price for newly-mined domestic gold the effective market price. From the end of November, however, until the end of January 1934, the announced price exceeded the market price abroad.

The aim of the gold policy was to raise the prices of farm products and raw materials. Most farm products and raw materials exported by the United States had a world market, hence the decline in the foreign exchange value of the dollar meant a roughly proportional rise in the dollar price of such commodities as cotton, petroleum products, leaf tobacco, wheat, and similar items.

The decline in the foreign exchange value of the dollar was initially a product of speculative sale of dollars in the expectation of devaluation -- a short-term capital outflow. The decline was sustained by shifts in the demand schedules for imports and the supply schedules of exports produced by the cessation of internal deflation. Prices rose in the United

States relative to prices in other countries. If the exchange value of the dollar had not fallen, the price rise would have discouraged exports and encouraged imports. These forces were subsequently reinforced by U.S. purchase of gold at home and abroad.

U.S. purchase of gold involved a reduction in the supply of goods for export, since gold is a potential export good, and hence a reduction in the demand for dollars by holders of other currencies (to buy the domestically produced gold). The purchase of foreign gold involved an increase in the demand for goods for import (namely, gold) and hence in the supply of dollars offered in exchange for foreign currencies (to buy foreign gold). The combined effect was to create a potential deficit in the U.S. balance of payments at the former exchange rate. Given a flexible rate, the potential deficit was closed by a depreciation of the dollar sufficient to generate, through an increase in exports or a decline in imports or a movement of speculative funds, an amount of foreign currencies exceeding the amount demanded for other purposes by enough to pay for the gold.

These effects depended very little on the fact that gold was the commodity purchased. Given a floating exchange rate, essentially the same effects on the dollar prices of internationally traded goods would have followed from the same dollar volume of

government purchase of wheat or perfume, or from the economically equivalent program, adopted after World War II, of building up stockpiles of foreign-produced strategic goods. As it was, the use of gold as the vehicle necessarily meant an accumulation of gold, just as the use of wheat or perfume would have meant the accumulation of that commodity.

The choice of gold as the vehicle did have an important effect on the impact of the program on foreign countries. In the first place -- and a corresponding effect would be present for any particular commodity -- the program had a special impact on gold-producing countries. In the second place -- and this effect would be present only for a commodity serving as the basis of a monetary standard -- it had a special impact on gold-standard countries. Being committed to sell gold at a fixed price in terms of their own currency, these countries necessarily experienced pressure on their gold reserves, which in turn necessitated either abandonment of the gold standard or internal deflationary pressure. Those countries were placed in the position of having to adjust downward their whole nominal price level.

The device used to achieve a decline in the exchange value of the dollar -- borrowing funds (through the issue of RFC securities) to purchase gold -- was not unprecedented. The identical device was employed before 1879 but that time for precisely

the opposite purpose: to promote a rise in the exchange value of the dollar. As noted above, the mechanical as opposed to the psychological effects of the accumulation of a gold reserve rendered resumption more rather than less difficult.

A major obstacle to using gold as a vehicle for lowering the exchange value of the dollar and thereby raising prices was the existence of the so-called gold clause in many government and private obligations and in private contracts. That clause, whose use dated back to the greenback period after the Civil War, required payment either in gold proper, or in a nominal amount of currency equal to the value of a specified weight of gold. It was designed precisely to protect lenders and others against currency depreciation. This clause, if honored, would have multiplied the nominal obligations of the federal government and of many private borrowers for interest and principal of debt by the ratio of the new price of gold to the old price of gold. Accordingly, a joint resolution was introduced in Congress on May 6, and passed on June 5, 1933, abrogating the gold clause in all public and private contracts, past and future. In February 1935, the Supreme Court, by a five-to-four decision, in effect upheld the constitutionality of that resolution. Not until the Act of October 28, 1977, was the prohibition against gold clauses removed, and express allowance for their use provided.

At the outset, the gold policy was one of two mutually inconsistent policies with respect to the monetary standard simultaneously pursued by President Roosevelt. The other was the organization of a World Monetary and Economic Conference which convened in London, June 1933. President Hoover had set in train the arrangements for the convocation of the conference in May 1932, and it was originally scheduled to be held in January 1933. The aim of the conference was to achieve cooperative action on international economic problems, and hopes were high that it would produce an agreement stabilizing foreign exchange arrangements. But the conference was nearly a complete failure. One reason was that, while it was in process, the President apparently decided definitely to adopt the path of currency depreciation. He sent a message to the conference on July 2, 1933, which disassociated the United States from any attempt to achieve what was described as a "temporary and probably an artificial stability in foreign exchange on the part of a few large countries" and was termed a "specious fallacy." The message was at the time given much of the public blame for the failure of the conference. However, whatever the President might have said and however consistent U.S. policy might have been, it seems dubious that the economic preconditions existed for a viable exchange stabilization agreement. The fundamental difficulties were the

probable incompatibility of the exchange rates of the sterling bloc and of the nations that still remained on gold, and the unwillingness at the time of the gold-bloc countries to change their gold parities.

The period of a variable price for gold came to an end on January 31, 1934, when the President, under the authority of the Gold Reserve Act passed the day before, reduced the gold content of the dollar to 13.71 grains and thus specified a buying and selling price of \$35 an ounce for gold ($480/13.71 = \35). He thereby devalued the gold dollar to 59 per cent of its former weight. Under the terms of the Act, title to all gold coin and bullion was to be vested in the United States; all gold coins were to be withdrawn from circulation and melted into bullion and further gold coinage was to be discontinued; the Secretary of the Treasury was to control all dealings in gold; and the President was authorized to fix the weight of the gold dollar at any level between 50 and 60 per cent of its prior legal weight.

Since the Treasury had formerly valued its own gold holdings at \$20.67 an ounce, and paid only that price for gold it acquired from private individuals, commercial banks, and the Federal Reserve System, it realized a large "paper" profit from the revaluation of the dollar; which is to say, the Treasury could print additional paper money entitled "gold certificates" to a nominal

value of nearly \$2 billion without acquiring additional gold and yet conform to the legal requirement that it hold a specified weight of gold (now less than before) for each dollar printed. Those gold certificates could not be legally held by private individuals, but they could be held by Federal Reserve Banks. Accordingly, to realize its "profits," the Treasury had to turn over gold certificates to the Federal Reserve System, receiving in return a deposit credit that it could convert into Federal Reserve notes or pay out by check. Stripped of its legal trappings, the economic effect was identical with a simple grant of authority to the Treasury to print and put in circulation nearly \$3 billion of fiat currency in addition to the \$3 billion in greenbacks already authorized by the Thomas Amendment to the Agricultural Adjustment Act.

Of the paper profit, \$2 billion was assigned to a stabilization fund set up under the control of the Secretary of the Treasury and authorized to deal in gold, foreign exchange, securities, and other credit instruments for the purpose of stabilizing the exchange value of the dollar. Of the balance of the paper profit, \$645 million was used for the redemption of national bank notes, which simply substituted one form of fiduciary currency for another; \$27 million was transferred to the Federal Reserve Banks for making industrial loans; \$2 million was

charged off to losses in melting gold coin; and \$141 million remained in the General Fund cash balance.

Thus the interlude during which the United States was not on a gold standard was concluded. The type of gold standard on which it operated thereafter is the subject of the section that follows.

6. 1934-1948 -- the interwar, World War II, and postwar managed gold standard²⁶

The official price of gold remained fixed at \$35 an ounce from February 1, 1934, until March 31, 1972, when the official price was altered to \$38. In this sense, the date in 1934 marked the return to a gold standard. But the gold standard to which the United States returned was very different, both domestically and internationally, from the one it had left less than a year earlier. The Mint bought all gold offered to it at the price of \$35 an ounce but sold only for the purpose of foreign payment. The holding of gold coin and bullion was forbidden to private individuals in the United States, except for use in industry and the arts and for numismatic holdings, and gold no longer circulated domestically. The Federal Reserve continued to have a gold reserve requirement, but the state of the reserve was not a direct influence on policy at any time from 1933 until the

threatened depletion of the gold reserve in the period from 1948 to 1968, under the Bretton Woods arrangements. In 1945, when the System was approaching the then existing requirement (40 per cent for Federal Reserve notes and 35 per cent for Federal Reserve deposits), the law was changed to require a uniform 25 per cent.

Fixed buying and selling prices for gold were no longer the main reliance for maintaining rigid exchange rates with other currencies, even those of countries nominally on gold. Instead, a new central bank organ was created, the stabilization fund, with powers to engage in open market purchase and sale of foreign exchange and nonmonetary gold to influence exchange rates. During the late 1930s, most of the so-called gold-bloc countries finally left gold, and nominally floating exchange rates with government speculation through stabilization funds became the rule. During the war, many countries fixed "official" exchange rates but sought to maintain them by extensive control over foreign exchange transactions, imitating the devices developed by Hjalmar Schacht for Germany in the 1930s, rather than by free purchase or sale at fixed prices of either gold or foreign exchange. Since then, an even wider variety of actual exchange rates came into use.

After 1934, the role of gold in the United States was not that of the base of the monetary system. Rather it became a com-

modity whose price was officially supported in the same way as the price of wheat, for example, was under various agricultural support programs. The major difference is that the support price for agricultural products was paid only to domestic producers, the gold-support price to foreign as well as domestic ones. In addition, the agricultural products accumulated were freely sold at the support prices to anyone, the gold only to certain foreign purchasers and not to any domestic ones. In consequence, the gold program set a floor under the world price of gold in terms of dollars.

The substitution in 1934 of a fixed price for gold, rather than a variable price as under the earlier purchase program in 1933 and early 1934, meant that the number of dollars spent on gold was no longer under the direct control of U.S. authorities. Having fixed the price, they were committed to buy all that was offered. But the effects of such purchases were the same as under the earlier program. For the United States, the purchases meant an increase in the dollar value of other exports relative to the dollar value of imports, thanks to a rise in prices of internationally traded goods relative to domestic goods through the combined effect of changes in exchange rates and in domestic price levels of the various countries. For gold-producing countries, the purchases meant an increased price for one of

their products, hence an expansion in the gold industry relative to other industries and a rise in income. For gold-standard countries, the price fixed for gold in the United States determined the rate of exchange between their currencies and dollars. They either had to adjust their internal price level to that new rate -- in the process presumably disposing of some of their reserves as measured in ounces of gold -- or to change their own fixed price of gold. For all gold-standard and gold-producing countries except the United States and for nongold-standard and nongold-producing countries, the gold purchases meant a reshuffling of international trade in response to a decreased U.S. demand for products other than gold, and an increased demand for such products by gold-producing countries; the program meant an increased supply of products from the United States and a decreased supply from gold-producing countries. Finally, international trade had to adjust to measures adopted by gold-standard countries to meet loss of their reserves.

The price fixed for gold initially overvalued the product and therefore stimulated a rapid increase in production and a rapid accumulation of government stocks. Production in the United States including its possessions rose from less than 2.6 million ounces in 1933 to 6 million in 1940; in the world from 25 million ounces in 1933 to 41 million in 1940. The rise in prices of

other commodities and services from 1940 to 1948 lowered the relative price of gold and reduced U.S. gold output (1948) below its 1933 level, though world output still exceeded the level of that year.

There was an initial sharp jump in the U.S. gold stock from January to February 1934 that was accounted for primarily by the revaluation of gold, but part was produced by the substantial amount of gold imported, as foreigners took advantage of the higher buying price that became official on January 31. Gold was almost immediately shipped to the United States. In the six weeks from February 1 to March 14, more than \$0.5 billion of gold (valued at the new price) was imported. Once the initial rush of gold imports ended, the gold stock continued to rise at a fairly steady rate to the end of 1937. Until France left gold in late 1936, roughly half of U.S. gold imports came from France. For the next year, France was a net importer of gold from the United States rather than a net exporter. During the last quarter of 1937, a large-scale withdrawal of foreign short-term balances followed rumors that further devaluation of the dollar was being considered as a possible counter-cyclical measure. Withdrawal of European short-term funds from the United States ceased in July 1938. These counter movements roughly offset the forces making for a continued flow of gold to this country, so

the total gold stock remained fairly steady from autumn 1937 to autumn 1938. Munich then led to a further flight of capital from Europe and a sudden increase in the rate of gold inflow. The outbreak of war simply maintained the rate of the gold inflow. The intensification of Britain's war effort after the fall of France in early 1940 and her attempt to tap American supplies of war material, as she had in World War I, produced a further increase. Finally, the enactment of lend-lease in early 1941, which relieved Britain and her allies of the necessity of acquiring dollars to finance war purchases, brought an end to the rapid growth of the gold stock. In sum, the gold stock in the Treasury rose from 200 million ounces when the support price was fixed in early 1934 to 630 million ounces by the end of 1940, a rise that was $1 \frac{3}{4}$ times as much as aggregate world output during the intervening period. The gold stock declined somewhat during the war, but an inflow in 1946-48, arising from the demand for U.S. goods of war-devastated and neutral countries, brought the stock to nearly an all-time high in 1948 (exceeded only in 1949).

The rise in the dollar price of currencies of gold-bloc countries was at first much greater than that of currencies not linked to gold. From January 1933 to September 1934 the rise was 70 per cent for the currencies of France, Switzerland, Belgium,

the Netherlands, and Italy, and less than 50 per cent for the pound sterling. The gold-standard currencies therefore appreciated not only relative to the dollar but also relative to other currencies. The differential appreciation measured the special impact of our gold price-support program on the position of the gold-standard countries. The fact that they lost gold meant that they bore, as it were, a larger part of the effect of the expansion of U.S. exports and contraction of U.S. imports other than gold than other countries did, and thereby cushioned the initial impact on those other countries.

Had nothing else intervened, the gold-standard countries would have had to reduce their internal price levels relative to those of other countries in order to stay on gold, that is, in order to render something like the new structure of exchange rates consistent with no pressure on the balance of payments. In fact, something else did intervene, but it intensified rather than eased the problem of the gold-standard countries. Gold purchases under the fixed price-support program coincided with a flight of capital to the United States from Europe largely induced by political changes: first, the rise to power of Hitler in Germany which led to a large-scale attempt to transfer capital out of Germany; then the increasing fears of war which led to a flight of capital from France, Britain, and other European

countries.

If the United States had continued its floating exchange-rate policy of 1933 and had fixed no firm price at which it was willing to buy the world's gold, the capital flight would have produced an appreciation of the U.S. dollar relative to other currencies, which would have discouraged exports from the U.S. and encouraged imports into the U.S. That outcome would have produced the unfavorable balance of trade required as the physical side of the capital import -- and incidentally, would have worked against one of the domestic objectives of New Deal policy, namely, to raise exports relative to imports as a means of stimulating employment. If, instead, the U.S. and other countries involved had all been on a gold standard of the nineteenth century variety, the attempt to transfer capital to the U.S. would have increased gold reserves in this country, even without a rise in the dollar price of gold, and decreased gold reserves abroad; it would have increased proportionately the money stock in the U.S. and thereby have promoted a rise in domestic prices and income; and it would have decreased the money stock abroad and thereby have promoted a fall in prices and income in foreign countries. These changes would have tended to produce precisely the same shift in relative prices and the same unfavorable balance of trade as the appreciation of the dollar under the

hypothetical floating exchange rates would have done

Since the flight of capital constituted an increased demand for dollars, its effects on exchange rates and on U.S. trade in commodities and services other than gold were in precisely the opposite direction to those of the gold price-support program and tended to offset them. There was simultaneously an increased offer of dollars for gold on the part of the U.S. government and an increased demand on the part of foreigners for dollars to hold. By trading assets held abroad for gold and transferring the gold to the U.S. Treasury, foreigners could acquire dollars and the Treasury could acquire gold without in any way affecting the rest of the U.S. balance of payments. To the extent that such offsetting occurred, the gold program did not affect U.S. trade currents and the relative prices of internationally traded goods in ways referred to earlier. Since such changes in trade currents and relative prices tended to reduce the amount of gold offered for sale to the United States at its fixed price, the capital inflow meant that this country acquired a larger amount of gold at \$35 an ounce than it otherwise would have. Hence, while the capital inflow and the gold price-support program had opposite effects on U.S. exchange rates and on U.S. trade in commodities and services other than gold, both tended to raise its gold stock. For gold-standard countries that were themselves

subject to a capital outflow -- that is, for all the important gold-bloc countries that had remained on gold after 1933 -- the capital inflow reinforced rather than offset the effect of the gold price-support program. It required an additional reduction in internal price levels beyond that called for by the support program. Exports had to be still larger relative to imports if they were to finance the capital outflow without a continued outflow of gold.

The deflation that would have been required by the combined effect of the U.S. gold price-support program and the capital outflow was more than the gold-bloc countries were willing to undergo, as perhaps the effect of either alone might also have been. Accordingly, in the fall of 1936, France and Switzerland devalued their currencies in conjunction with a tripartite agreement between the United States, France, and Great Britain. The governments of Belgium and the Netherlands, which followed suit, and Switzerland also subscribed to the agreement.²⁷

All these countries set up exchange stabilization funds. The Tripartite Agreement of September 25, 1936, provided that stabilization fund holdings of foreign currencies would be used to avoid undesirable fluctuations in exchange rates. Arrangements for mutual currency support were undertaken, based on daily gold settlements at prearranged prices. Each day the authorities of

the six countries would cable each other the prices in terms of their own currencies at which they would sell and buy gold for the next twenty-four hours. Each party would then decide, without risk of exchange losses, the buying and selling rates for the currencies of the other participants. Foreign balances at the end of each day were convertible into gold at the guaranteed price. The agreement was a precursor of the swap arrangements that the industrialized countries perfected during the Bretton Woods period of international monetary arrangements. Under the agreement, the U.S. stabilization fund purchased foreign currencies in New York at rates the foreign funds determined and that day converted these currencies into gold earmarked to its account abroad or released to it from foreign earmarked holdings in the United States. Mainly, however, gold imports into the United States were brought in by foreign monetary authorities or private sellers of gold to the U.S. Treasury, not by the Exchange Stabilization Fund.

In purchasing gold, as in purchasing agricultural or other commodities, the U.S. government can be said to have three sources of funds: tax receipts, borrowing, or money creation. The one difference is that the support program for other commodities (excepting silver) carried with it no authorization to create money, whereas the support program for gold did, thereby automa-

tically providing the financial means for its continuance.

=Treasury deposits at Federal Reserve Banks could be increased through gold purchases by gold certificate credits equal to the amount of gold purchased times the official price of gold. Except for a minor handling charge ($1/4$ of 1 per cent), this was also in practice the amount the Treasury spent by drawing a check on its deposits in acquiring gold. Gold purchases were usually financed in this way; hence, increases in the gold stockpile produced no automatic budgetary pressure. The link between gold purchases and Treasury authorization to create high-powered money was the main remnant of the historical role of gold, and served to give gold some special monetary significance. The one important occasion when a different method of finance was used was in 1937, when the Treasury "sterilized" gold by paying for gold with funds raised through security issues.²⁸

It is easier to describe the gold policy of the United States during the years 1934-1948 than it is to describe the resulting monetary standard of the United States. It was not a gold standard in the sense that the volume of gold or the maintenance of the nominal value of gold at a fixed price could be said to determine directly or even at several removes the volume of money. It was clearly a fiduciary rather than a commodity standard, but it is not possible to specify briefly who managed its

quantity and on what principles. The Federal Reserve System, the Treasury, and still other agencies affected the quantity of money by their actions in accordance with a wide variety of objectives. In principle, the Federal Reserve System had the power to make the quantity of money anything that it wished, within broad limits, but it seldom stated its objectives in these terms. It sometimes, as when it supported the prices of government securities from 1942 to 1951, explicitly relinquished its control. And it clearly was not unaffected in its actions by gold flows. So long as the exchange rate between the dollar and other currencies was kept fixed, the behavior of relative stocks of money in various countries was necessarily close to what would be produced by gold standards yielding the same exchange rates, even though the mechanism might be quite different.

7. 1948-1968 -- the Bretton Woods dollar/gold standard system²⁰

The international monetary system that was designed at the Bretton Woods Conference in 1944 reflected professional views on the defects of the arrangements that had prevailed in the 1930s. Protectionist trade policies, controls on capital movements, exchange controls, and competitive currency depreciations of the pre-World War II period were the cautionary experiences to be avoided by the postwar world. Removal of controls on the free

September 1949, when the pound was devalued. The Netherlands thereupon devalued the guilder, and France, which had had separate rates for financial and commercial transactions, unified them, depreciating the franc vis-a-vis sterling.

In private gold markets until 1953, the price of gold was at a premium, but the IMF rule required monetary authorities to refrain from selling gold at premium prices. In March 1954, several months after the premium had been eliminated, reflecting balance of supply and demand, the London gold market reopened. For the rest of the decade, the price of gold in private markets remained at \$35 an ounce.

With the return of many European currencies to convertibility in 1958, the achievement of the Bretton Woods conception of international monetary normalcy seemed only a matter of time. The outflow of dollars in U.S. official aid, military spending, and private investment, and economic recovery in Europe and Japan had enabled foreigners to add to their holdings of dollars and gold. U.S. prices were stable until the middle of the decade of the '60s, and their rate of rise generally lower than in the rest of the world. Money supplies in the rest of the world (except in the U.K.) grew at a faster rate than in the U.S. perhaps as a result of the U.S. contribution to the buildup of other countries' monetary reserves. The dollar's status as the reserve

currency of the international economy seemed impregnable. Commercial banks and private firms could make foreign payments in their convertible currencies without the approval of central banks. Tariff and quota restrictions on commodity trade among the industrialized countries were eased and foreign trade grew at a rapid rate during the period. International transfers of capital grew, with New York at the center of the flows, and the dollar as the vehicle currency in which the borrowers obtained capital and the investors lent their savings.

The successful operation of the system depended on foreign central banks intervening with their own currencies against the dollar to maintain par values, and the Federal Reserve abstaining from intervening to maintain the dollar exchange rate against other currencies. The U.S. balance of payments accordingly was determined by the exchange parities other countries established to achieve payments surpluses that would add to their dollar reserves.

A portent of the troubled future of the system was that 1960 was the first year in which U.S. gold reserves declined below the level of its total liquid liabilities to all foreign holders of assets denominated in dollars (Table 2-1).

Until March 1961, the U.S. intervened to maintain the price of gold by selling and buying dollars. Concern over the con-

tinuing conversion of dollars into gold led the Treasury to activate the Exchange Stabilization Fund and on March 13, 1961, the Federal Reserve Bank of New York as its agent was authorized to buy or sell foreign currencies in the forward exchange market.³⁰ It sold forward D-marks to reduce the premium on that currency. On February 13, 1962, the Bank was also authorized to buy or sell foreign currencies on behalf of the Federal Open Market Committee in both spot and forward markets. For this purpose a stock of foreign currencies in addition to those acquired from the Stabilization Fund was needed. The Federal Reserve therefore negotiated a network of swap facilities with the central banks of other countries. The swap provided a specific amount of foreign currency in exchange for an equivalent dollar credit for the foreign central bank, with each party protected against loss due to a change in par values. Invested balances of both parties earned the same rate of interest, foreign balances in special U.S. Treasury certificates, Federal Reserve balances in interest-earning deposits abroad. Balances were available for payments to other central banks or for foreign exchange market transactions. The swap was a credit line, for 3- or 6-month periods, renewable at maturity. By drawing on the credit, gross reserves of both parties were increased. The U.S. normally used the proceeds of a swap to absorb dollar holdings, in effect, substituting forward dollars for spot dollars held by the partner, to reduce the threat of their conversion into gold.

Table 2-1

U.S. Monetary Gold Stock and Liquid Liabilities to Foreigners
(millions of dollars)

End of Year (1)	Total Monetary Gold Stock ^a (2)	Total Liquid Liabilities to All Foreigners ^c (3)
1954	21,793	12,454
1955	21,753	13,524
1956	22,058	15,291
1957	22,857	15,825
1958	20,582	16,845
1959	19,507	19,428
1960	17,804	20,994
		21,027
1961	16,947	22,853
		22,936
1962	16,057	24,068
1963	15,596	26,361
		26,322
1964	15,471	28,951
		29,002
1965	13,806 ^b	29,115
1966	13,235	29,904
		29,779
1967	12,065	33,271
		33,119
1968	10,892	33,828
		33,614
1969	11,859	41,735
		41,894
1970	11,072	43,291
		43,242
1971	10,206	64,266
		64,223
1972	10,487 ^d	78,680
1973	11,652 ^e	87,520
1974	11,652	119,164 ^f
1975	11,599	126,552 ^f
1976	11,598	151,356 ^f
1977	11,719	192,321 ^g
1978	11,671	
1979	11,172	
1980	11,160	

Notes to Table 2-1

Source: A. Banking and Monetary Statistics, 1941-1970. Board of Governors of the Federal Reserve System, Washington, D.C., 1976.

B. Federal Reserve Bulletin, March 1975, A61, A63; March 1978, A55, A57; June 1978, A56; May 1981, A53, A56.

Col. (2): Source A, p. 899; Source B, A61, A55, A56.

Col. (3): Source A, pp. 932-933; Source B, A63, A57, A56.

^aThe stock includes gold sold to the U.S. by the IMF with the right of repurchase, and gold deposited by the IMF to mitigate the impact on the U.S. of foreign purchases for the purpose of making gold subscriptions to the IMF under quota increases.

^bThe figure excludes \$259 million gold subscription to the IMF in June 1965 for a U.S. quota increase that became effective Feb. 23, 1966.

^cThe total includes small amounts due to the IMF arising from gold transactions, amounts due to official institutions, commercial banks abroad, to other foreigners, and to nonmonetary and regional organizations. Nonliquid liabilities to official institutions included in the source beginning 1962 through 1973 have been deducted. Years for which two entries are shown show differences because of changes in reporting coverage. Figures on the first line are comparable with figures for preceding dates; figures on the second lines are comparable with those for the following dates.

Notes to Table 2-1 (concluded)

^dChange in par value of dollar on May 8, 1972, increased the value of the total gold stock by \$822 million.

^eChange in par value of dollar on Oct. 18, 1973, increased the value of the gold stock by \$1,165 million.

^fNonliquid liabilities which are not distinguished in the source may be included. Preliminary figures for 1974 showed nonliquid liabilities equal to \$6,124 million. In 1973, the total for the item was \$4,871 million.

^gThe table giving U.S. liabilities to all foreigners was discontinued after the June 1978 issue of Source B. A new table, Selected Liabilities to Foreign Official Institutions, replaced it. The entries for 1975-1980 are as follows.

1975	82,572
1976	95,634
1977	131,097
1978	162,589
1979	149,481
1980	164,312

Source B: Dec. 1978, A58; May 1981, A56.

Repayment of short-term swap credits meant a corresponding decline in gross reserves. For the U.S. this could entail a loss of gold. To deter this eventuality, the U.S. began issuing non-marketable bonds, with maturities of 15 months to two years, denominated in the holder's currency, to fund outstanding swap debt. The bonds were, however, convertible into Treasury bills on demand.

A further indication of U.S. concern about gold was the prohibition after mid-1961 on holding of gold outside the U.S. by U.S. firms and households, and on March 3, 1965, the abolition of gold reserve requirements against Federal Reserve deposits.

A focus of pressure on the U.S. dollar was the London gold market. In March 1960, the price rose above \$35 an ounce, as European central banks and private investors bought gold for dollars. The Bank of England sold gold to stabilize the price, but the U.S. Treasury initially was not willing to restore the Bank's holdings. Hence, when a rise in the price of gold occurred in October, the Bank did not intervene. On October 27, with the price reaching \$40 an ounce, the Treasury agreed to sell gold to the Bank, reserving for the Bank the decision on intervention in the market. European central banks soon after agreed

to refrain from buying gold in the London market for monetary purposes whenever the price rose above \$35.20, the U.S. price plus shipping costs. When the price fell below that level in 1961, the central banks returned to the market. However, in October 1961, when the price again was reacting to heightened demand, an agreement to create a "gold pool" was reached, on U.S. initiative. The U.S. contributed \$135 million to the pool and seven European governments an equal amount to be used to replenish gold sold by the Bank of England as manager of the market. The members of the pool subsequently agreed not to buy gold individually on the market, but to give the Bank of England the right to buy on their joint account when gold supply exceeded demand, the amount purchased to be distributed in proportion to each country's contribution to the pool. The pool functioned until the end of 1967, when a surge of buying led to the suspension of the arrangement in March 1968.

A key development for the international monetary system that was not perceived as such at the time was the acceleration of the U.S. monetary growth rate and the subsequent acceleration of the U.S. inflation rate in the final years of this subperiod. What was perceived was the cumulative growth of deficits in the U.S. balance of payments. Assets denominated in dollars grew in excess of the demand for them by the rest of the world. Their

conversion into gold, by shrinking U.S. gold reserves, threatened one of the basic underpinnings of the Bretton Woods structure, namely, convertibility of dollars into gold.

The Bretton Woods system might have been able to survive an end of gold convertibility. It could not survive inflationary monetary policy in the center country that characterized the decade from the mid-60s on. Crisis management by the IMF and the central banks of the leading industrialized countries became the hallmark of the international monetary system during the heyday of Bretton Woods.³¹ The chief currency under pressure, apart from the dollar, was sterling. Persistent or recurring U.K. balance of payments deficits impaired the credibility of sterling's external value, already insecure by reason of the size of sterling balances held worldwide relative to U.K. gold and foreign exchange reserves. Private agents displayed lack of confidence in the dollar and sterling by shifting to currencies whose external values were regarded as stable or likely to appreciate (during this period, the D-mark and guilder). Repeated rescue operations to support the exchange value of sterling were overwhelmed in November 1967. Sterling, however, was a sideshow. The main act was the dollar's performance.

The gold market was the market in which participants expressed lack of confidence in the dollar-based international

monetary system. After the devaluation of sterling in November 1967, the vulnerability of the dollar took center stage. In the winter of 1967-68, a surge of demand for gold threatened both the London gold pool and the \$10 billion statutory backing for Federal Reserve notes. On March 12, 1968, the U.S. gold reserve requirement was abolished. Ostensibly, the gold stock was then available for conversion of dollars held by foreign central banks. On March 17, however, the London gold market was closed to avoid further U.S. gold losses. The contributors to the gold pool announced that they would no longer supply gold to the London or any other gold market or buy gold from the market. Official transactions between central banks were to be conducted at the unchanged official price of \$35 an ounce, but the gold price for private transactions was to be determined in the market. Central banks were still free to buy U.S. Treasury gold for dollars but in fact refrained from doing so. Germany had explicitly forsworn converting its dollar holdings into gold in May 1967.

One measure the U.S. authorities might have taken was a rise in the dollar price of gold, thus increasing the value of the stock and the flow of reserve assets. If other countries did not follow suit by adopting a proportional increase in the price of gold in their currencies, the U.S. in this way might have

obtained a devaluation of the dollar that the Bretton Woods system otherwise ruled out. Had the price of gold risen, the gold demands of other countries might have been satisfied without the rundown in U.S. reserve assets. Some countries might also have revalued because of the inflationary consequences of their payments surplus, given the gold-based increase in their asset holdings.

The U.S., however, resolutely opposed a change in the monetary price of gold. Given the fixed price of gold when national price levels were rising, gold became an undervalued asset with a resulting gold shortage.

The measures adopted to avoid exchange rate changes were intended to limit international transmission of price change.³² Surplus countries tried to avoid price increases; deficit countries, price declines, both as external consequences of their balance of payments positions. Intermittently, depending on cyclical conditions, countries in both categories took steps to right payments imbalance.

Since palliatives to improve the balance of payments proved ineffective, deficits had to be financed either by drawing down reserves or seeking external credit or borrowing facilities, while surpluses obviously increased reserve accumulations. During the heyday of the Bretton Woods system, despite the growth of dollar

assets, the adequacy of international liquidity, in the sense of the quantity of international monetary reserves, was widely debated. Discussions during this period growing out of concern for the supply of reserves led to the creation of SDFs by the IMF, but that development belongs in the account of the breakdown of the system.³³ Until 1968, international reserves were limited to gold, convertible foreign exchange, and reserve positions in the IMF.

Contrary to the design of Bretton Woods, financing of payments imbalances for the most part was arranged through credits governments extended on a bilateral basis and through international borrowing and lending activities of commercial banks. Thus to restore depleted reserves of countries with persistent deficits, facilities for borrowing were created in addition to drawings from the IMF.

Official dollar reserves of the surplus countries were augmented at times by actions those countries took in the Eurodollar market. Dollars acquired by their central banks and deposited in the Eurodollar market either directly or through the Bank for International Settlements would usually be relent to private borrowers who could resell the dollars to the central banks. In sum, world reserves grew rapidly during the period.

8. 1968-1973 -- the breakdown of the Bretton Woods system

The devaluation of sterling in November 1967 was not regarded as the prelude to changes in the par values of other currencies, the devaluation of the dollar in terms of gold, the realignment of exchange rate relationships among the major currencies, and the substitution of a short-lived regime of central rates for the par value system -- all of which took place between November 1967 and December 1971. Instead, it was hoped that balance in the U.S. and U.K. external payments was finally on the point of achievement, and that the creation of a special drawing rights facility in the IMF would replace reserve assets that dollar and sterling deficits had provided.

The hope was belied. The pattern of deficits and surpluses persisted and worsened in 1970 and 1971. The U.S. current account surplus dwindled and the U.S. capital account deficit grew dramatically, producing current account surpluses and capital inflows in other countries. The activation of SDRs in 1970-72 provided additions to already massive acquisitions of dollar reserve assets.³⁴

As in the heyday of the Bretton Woods system, disbelief of market participants in the pegged external values of currencies precipitated turbulence in the foreign exchange market.

The persistent outflow of funds from the U.S. overwhelmed

foreign exchange markets in the first few days of May 1971. On May 5, seven European countries closed their foreign exchange markets, and five others on several continents withdrew their support for the dollar and suspended dealings in D-marks, guilders, and Swiss francs. On May 9, both Germany and the Netherlands announced that their currencies would float, since they could not maintain exchange rates within the established margins.

In March 1971, before the panic of the foreign exchange market, there was a request from several European countries for conversion of officially held dollars into gold to enable them to pay for an increase in their IMF quotas. The payout reduced the U.S. gold stock to the lowest level since 1936. The dollar outflow meanwhile accelerated, leading, as noted, to the floating of European currencies. The imbalance between U.S. gold reserves and outstanding dollar liabilities occasioned the changes the U.S. introduced on August 15, 1971, to achieve a dollar devaluation. Chief among them (besides a price and wage freeze, tax increases and federal government spending cuts) was a 10 per cent import surcharge on 50 per cent of total U.S. imports. The convertibility of the dollar into gold was formally suspended, as was also the swap network through which dollars could be exchanged with central banks for other currencies. The effect

was to oblige other countries to hold dollars or to trade them for a price determined in the market and so revaluing their currencies. Foreign exchange markets abroad, except in Japan, shut down. The Japanese initial attempt to maintain the pegged rate of the yen compelled them to purchase \$11 billion in the two weeks after August 15. The yen was then freed to float upward; other currencies floated when exchange markets were reopened on August 22. France introduced a dual exchange market, with trade and government exchange dealings based on the par value, financial exchange dealings at a floating rate. Restoration of a pegged system of exchange rates, however, remained the goal of the U.S. and its partners.

After much negotiation, a readjustment of currency parities was arranged at a meeting at the Smithsonian Institution in Washington on December 17-18, 1971. In return the U.S. agreed to withdraw the import surcharge. Currencies were revalued by percentages ranging from 7½ (Italy) to 16.9 per cent (Japan), with the proviso that 2¼ per cent margins of fluctuations (replacing the former 1 per cent margin) above and below the new so-called "central" exchange rates were permissible. The Canadian dollar continued to float. The Smithsonian agreement also specified that the official dollar price of gold would henceforth be \$38, a concession by the U.S. for appearance sake only, since the dollar

remained inconvertible. The new price of gold implied a depreciation of the gold-value of the dollar rather than an appreciation of the dollar value of other currencies.

The central rates established at the Smithsonian meeting crumbled during the nine months following the floating of sterling in June 1972. Once again, the disbelief of market participants in those rates was revealed in the gold and foreign exchange markets. The London free market price of gold rose with few reversals. Money growth and inflation rates continued to rise in the U.S. and both the balance of trade and the U.S. balance of payments deficit soared, with a corresponding surge in dollar holdings of the industrialized European countries and Japan. Capital controls were imposed in 1972 by the Netherlands and Japan before sterling was floated and Germany followed suit afterwards. On February 10, 1973, Japan closed its foreign exchange market and suspended support of the dollar. New central values were set in a hurried round of negotiations, although the lira, yen, Canadian dollar, the U.K. and Irish pounds, and the Swiss franc all floated. Again, the official price of gold was raised (this time to \$42.22), leaving unchanged the gold value of other currencies. The new central rates did not staunch the flow of dollars abroad, and a further crisis erupted in March 1973. This time the major industrial countries discontinued pegging

their exchange rates to the dollar. The FEC countries in the snake, which had been activated in April 1972, plus Sweden and Norway agreed to a joint float, with Germany revaluing by 3 per cent (in terms of SDFs) in relation to the other members. Canada, Japan and Switzerland floated individually, as did a handful of other countries. Though a large group of nonindustrialized countries pegged to the dollar, the dollar currency area worldwide contracted; smaller groups of countries pegged to the French franc or to the pound.

9. 1973-1981 -- the United States on an inconvertible paper standard

When pegged rates were abandoned in March 1973, it was initially assumed that floating was a temporary expedient to be succeeded by a reformed par value system. The U.S. took the lead in opposing the return to such a system. The dispersion of inflation rates among the industrialized countries and the higher variability of rates of inflation since the late 1960s enforced more frequent changes of exchange rates. Under the earlier system, changes in par values were delayed until foreign exchange market crises were provoked. The lesson since the shift in March 1973 was that floating provided more flexibility. The U.S. view prevailed. In place of the par value system ordained in the

Articles of the Bretton Woods charter, an amendment in April 1976 gave member banks the option to float for an indefinite period or to peg exchange rates, at their discretion. The IMF accepted a fait accompli although, to placate opponents of the float, another provision stipulated that at a future unspecified date reestablishment of a system of fixed but adjustable rates was possible with an 85 per cent affirmative vote by the members, thus giving the U.S. an effective veto.

It was widely believed that the stock of reserve assets would contract in a world of floating exchange rates compared to a world of pegged rates. In fact, official holdings of reserve assets have increased in every year since the float. From 1950 to 1969, on average, world reserves including gold rose by less than 2 per cent per year, the foreign exchange component by 5 per cent per year. From the end of 1969 to the end of 1972, the average annual rate of increase of foreign currency reserves was 12 per cent. Since 1973, the average annual rate of increase has been 15 per cent. The main source of growth of foreign currency reserves since 1973, as in earlier years, has been in the form of dollars. The demand for reserves has increased even under floating rates because the system is substantially managed.

A significant change in the distribution of foreign exchange reserves has occurred since October 1973 as a result of the rise

in the price of oil. Total foreign exchange reserves of industrial oil-importing countries have remained roughly stable, but the major oil-exporting countries, which in 1970 held only about 5 per cent of total world foreign exchange reserves, by the end of the decade held about one-quarter of the total, the value of which had tripled since 1970.

The dollar has continued to serve as the main reserve currency, accounting for about 80 per cent of the world's official foreign exchange reserves. As under devalued rates, the U.S. continues to pay for its imports in dollars, which foreigners add to their reserve accumulations, and use to settle their deficits with other countries. The dollar also remains the common official intervention currency in foreign exchange markets, and serves as a common vehicle currency in the interbank market for foreign exchange. In effect, the world has adopted an inconvertible dollar standard.

One change in the international reserve profile was the creation on March 13, 1979, of the European Monetary System -- replacing the "snake", the European joint float -- by nine European countries (Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, and the Netherlands; the U.Y. is a member but does not participate in intervention arrangements). The center of the system is the European Currency Unit (a basket of all

nine currencies), issued by the European Monetary Cooperation Fund in an amount equal to a deposit of 20 per cent of gold and dollar reserves of participating countries, to be used for settlement of intervention debts. FCUs, now included in foreign exchange holdings of the participating countries, do not increase world monetary reserves. The FCUs issued value gold on the basis of either the average market price of the six preceding months or the average market price on the day before issue, whichever was lower.

With gold valued at market price, world gold reserves at the end of 1970 were larger than foreign exchange reserves. The U.S., however, values its own gold assets at the official price of \$42.22 per ounce, despite the IMF's abolition of that price.

After the float, the U.S. took the position that gold should be demonetized. An opposing view was promoted principally by France. Developments reflect the extent to which one or the other dominated international decisions. At issue was the use of gold in official transactions at the free market price, and the substitution of gold for the dollar in inter-central bank settlements at a fixed but higher official price.

The ban on official transactions in the gold market that had been adopted in March 1968 was terminated in November 1973, but the official price of \$42.22 posted in February 1973 was so far

below the private market price that central banks were unwilling to buy and sell gold among themselves at the official price. The central banks were equally reluctant to sell gold on the private market in view of the possible depressive effect of sales on the market price or in anticipation of the opportunity to sell in the future at a higher price. In December 1973, the IMF terminated a decision made four years earlier to refrain from purchasing South African gold for the Fund.

In June 1974, countries in the Group of Ten agreed that an inter-central bank loan could be collateralized by gold at a price other than the official gold price, and in September, Italy obtained a loan from Germany on the pledge of Italian gold valued at a mutually agreed price. In December, the U.S. and France agreed that central banks were at liberty in valuing gold holdings for balance sheet purposes to use the market price, which the Bank of France proceeded to do.

Early in 1975, the countries in the Group of Ten and Switzerland agreed for a two-year period not to increase the surpluses of their and the IMF's gold holdings and to contribute no support to the price of gold in the free market. In August 1975 an agreement was reached by an IMF committee that³⁵

The official price of gold would be abolished
members would not be obliged to use gold in
transactions with the Fund

a part of the Fund's gold holdings would be sold at auction for the benefit of developing countries and another part would be returned to member countries in proportion to their quotas.

The first public auction of part of the Fund's gold holdings was held in June 1976. A four-year sales program was scheduled. In the first two years, 16 auctions were held approximately every six weeks, with aggregate sales of 12.5 million ounces. The balance of 12.5 million ounces was sold mainly in 24 auction lots through May 1980, and a small amount in noncompetitive sales. Restitution of 25 million ounces to member countries over a four-year period was completed in December 1979/January 1980.

The U.S. repealed the prohibition against gold holding by U.S. residents as of January 1, 1975, and empowered the Treasury to offset any increase in market price as a result of this increment to private demand by offering gold at auction. The first auctions were held in January and June 1975, when the Treasury disposed of 1.3 million ounces. No auctions were held in 1976 and 1977. They were resumed in 1978 and 1979, when the Treasury sold 4.0 and 11.8 million ounces, respectively, motivated as much by the desire to reduce the U.S. balance of payments deficit on current account as by the belief "that neither gold nor any other commodity provides a suitable base for monetary arrangements."³⁶

The gold sales constituted open market operations approximating \$0.8 billion in 1978 and \$3.6 billion in 1979. Gold sales

by the Treasury reduced the public's deposits and so bank reserves. The sales thus initially provided a partial offset to Federal Reserve open market purchases of government securities that increased the public's deposits and bank reserves. It was a partial offset only because the System's portfolio of government securities showed a net increase of \$7.7 billion in 1978 and of \$6.0 billion in 1979. It was an offset initially only depending on the Treasury's use of the proceeds of the gold sales. To the extent that the Treasury used the proceeds to retire gold certificate credits and thereby reduced its deposits at the Federal Reserve, the monetary effects of the gold sales were contractionary. However, to the extent that it disbursed the remainder of the funds it acquired, the Treasury's action restored the public's deposits and bank reserves, so the contractionary effect on the money supply of the gold sales was limited.²⁷

Since 1970, the Treasury has sold no gold bullion. In July 1980, however, it began the sale of half-ounce and one-ounce gold medallions, in accordance with P.L. 95-630, November 10, 1979. The legislation provided that not less than 1 million troy ounces of fine gold be struck into medallions and sold to the public over a five-year period at a price covering all costs. In 1981, U.S. Government gold inventories amounted to 264.2 million ounces. The Reagan Administration has announced that its posi-

tion on the proper role of gold in the international monetary system will not be formulated until the Congressionally mandated Gold Commission issues its report.

Direct official intervention to maintain the open market price of currencies within narrow limits has not lessened under floating rates compared with the pegged parity system. Intervention in some countries is assigned to nationalized industries that borrow foreign currency in order to buy their own currency on the foreign exchange market, in Italy and the U.K., with government provision of insurance against foreign exchange loss, in France with no such provision. In Japan and sometimes in France, dollar deposits held by the government at commercial banks are used for intervention. Italian and French commercial banks intervene at the government's behest. Central bank intervention may thus be conducted by a variety of institutions at the direction of the monetary authorities.

The pattern of intervention since the float by the U.S. and its trading partners is to buy dollars both when the dollar depreciates and when foreign currencies appreciate. Countries with weak currencies sell dollars. When the supply of dollars increases in foreign exchange markets, managed floaters may buy up some of the additional dollars or may permit the price of dollars to fall in terms of their own currencies. Buying up

dollars has negative consequences for domestic monetary control; permitting the price of dollars to rise has negative consequences for oil-importing countries.

There was apparently little intervention during the four months following the float in February 1973. The progressive decline in the weighted exchange rate of the dollar between February and July 1973 vis-a-vis a group of major currencies led to a decision by the governors of the central banks of the Group of Ten to support the dollar. In July 1973, the Federal Reserve Bank of New York began to intervene in the New York spot exchange market to maintain "orderly market conditions." Intervention was effected with the Federal Reserve's own small holdings of foreign currency or by activating the much larger total of foreign currency loans through swap agreements.

Concerted exchange intervention was agreed to by the Federal Reserve, the Bundesbank, and the Swiss National Bank in May 1974, after several months of dollar depreciation. The dollar strengthened until September when renewed weakness developed through March 1975. The explanation given by the Board of Governors was:²⁹

Contributing to this decline in the dollar's exchange value was the asymmetry in intervention policies between countries with weaker currencies and those with strengthening currencies. Intervention sales of dollars by countries supporting weaker currencies exceeded purchases of dollars

by countries resisting the appreciation of their currencies. The net effect of these operations was to add to the market supply of dollars, depressing the dollar's average exchange rate.

Explicit approval of management of floating exchange rates was expressed by the IMF in six guidelines it issued in June 1974.³⁰ Acceptance of intervention as desirable policy was reiterated in a November 1975 meeting that preceded the revision of the IMF's Articles of Agreement in 1976.

Since the dollar showed little weakness in 1976, the Federal Reserve intervened to sell dollars on behalf of other currencies. In January the Italian lira came under pressure. The decline in its exchange value weakened the French franc within the European currency "snake," leading to substantial French intervention. Massive intervention to support sterling which declined from \$2.00 in March to \$1.77 in mid-September was provided by a \$5.3 billion stand-by credit arranged by the Group of Ten countries, Switzerland, and The Bank for International Settlements. Sterling's further decline later in the year led to an IMF drawing, further borrowing, and a facility to reduce official sterling balances. Interventions were also engaged in to moderate appreciations of the D-mark, the Swiss franc, and the yen.

Renewed weakness of the dollar in early 1977 was masked by large intervention purchases of dollars by the Bank of England

and the Bank of Italy undertaken to limit the appreciation of their currencies and to rebuild their reserve positions. The Federal Reserve intervened only occasionally during the first three quarters. When the Bank of England ended its large purchases of dollars, the dollar dropped sharply. The Federal Reserve increased the scale of intervention, joined by the U.S. Treasury, which negotiated a new swap facility between the Exchange Stabilization Fund and the Bundesbank.

The decline in the weighted average exchange value of the dollar accelerated in 1978 through the end of October.⁴⁰ An anti-inflation program announced on October 24 (contractionary fiscal and monetary policy, voluntary wage and price standards, and a reduction in the cost of regulatory actions) had no effect on the exchange market. On November 1, the Administration and the Federal Reserve took further action. A \$30 billion intervention package was arranged with Germany, Japan, and Switzerland. The Federal Reserve raised the discount rate from 8½ to 9½ per cent, and imposed a 2 per cent supplementary reserve requirement on large time deposits. During the last two months of 1978, U.S. support operations for the dollar totaled \$6.7 billion, including sales of Treasury securities denominated in foreign currencies, accompanied by significant purchases of dollars by Germany, Japan, and Switzerland. By June 1979, the dollar had risen from

its 1978 trade-weighted low by about 10 per cent. From that month on, the dollar weakened. The Federal Reserve raised the discount rate to 11 per cent in September, and the U.S. sold the equivalent of \$1.2 billion in D-marks between August and early September.

On October 6, 1979, the Federal Reserve announced a wide-ranging set of measures to tighten monetary control (a shift in operating procedures from control of the Federal Funds rate to control of bank reserves; an increase in the discount rate to 12 per cent; a marginal reserve requirement on banks' managed liabilities), and the dollar began to appreciate. After April 1980, however, the dollar began to decline, a movement that was reversed in September. From February 1980 on, the U.S. intervened frequently, operating on both sides of the market. When the dollar was in demand, it acquired foreign currencies in the market and from correspondents to repay earlier debt and to build up balances. The Federal Reserve was a buyer from February to March. From late March to early April and beyond, it sold D-marks, Swiss francs, and French francs. By the end of July, the U.S. was again accumulating currencies. Both the Treasury and the Federal Reserve Trading Desk purchased D-marks and lesser amounts of Swiss francs and French francs on days when the dollar was strong, selling on days when the dollar weakened. By the end

of 1980, the U.S. was in currency markets on a day-to-day basis.

The Reagan Administration has announced its intention to reduce the scale of intervention, to discontinue the policy of building up currency reserves, and to cut back its short-term swap arrangements with foreign countries. The reason for the shift in policy is the administration's view that intervention is both costly and ineffectual, and that the way to restore exchange rate stability is by the creation of more stable domestic economic conditions. European central banks do not share the Reagan Administration's views and continue to intervene to affect the exchange value of their currencies. This raises a question whether the degree of control U.S. authorities can exercise over the effective exchange rate for the dollar under a floating rate system is any greater than under a pegged exchange rate system.

The Bretton Woods system broke down essentially because non-reserve currency countries were unwilling as a group to adopt the policy of inflationary monetary growth the reserve-currency country was pursuing. To achieve independent monetary policy, the only workable exchange rate system was floating. Flexible exchange rates permit a country to choose its desired long-run trend rate of monetary growth and of inflation, independent of other countries' choices.

Even when autonomy exists, monetary policy may perform badly.

It is in this context that the movement in a number of countries during the 1970s toward the improvement of monetary control must be viewed.

Central banks have typically used short-term interest rates as the instrument to control monetary growth. Under non-inflationary conditions, this conduct produced a pro-cyclical movement in monetary growth. Under the gathering inflationary conditions since the mid-1960s, the inflation premium that became imbedded in interest rates made the instrument unreliable as an indicator of restriction or ease. Reliance on it contributed to a secular rise in the rate of monetary growth. Central banks in a number of countries, some more willingly than others, in the 1970s adopted targets for monetary growth without necessarily abandoning their desire to hold down interest rates or exchange rates, so that successful targeting has not invariably been the result. If it was hoped that public announcement of targets for monetary growth would itself reduce expectations of inflation, the failure time after time to achieve the targets has diluted any possible effect on the formation of expectations.

The period since October 6, 1979, when the Federal Reserve announced a new procedure to improve control of monetary aggregates, is probably too brief to pronounce judgment on the likelihood that the System will achieve its objectives of steady

deceleration in monetary growth. The inconvertible paper monetary standard operated at the discretion of monetary authorities is on trial.

What is the current role of gold? IMF members no longer define the exchange value of their currency in terms of gold and trade in and account for gold at any price consistent with their domestic laws. Gold is no longer the numeraire of the international monetary system. The introduction of SDFs (valued in terms of a basket of national currencies, as of July 1974), rather than in terms of gold, was intended to replace both the dollar and gold in the international monetary system.

The market price of gold has increased more rapidly since the float than the prices of most other durable assets.⁴¹ The future role of gold in the international monetary system as a reserve asset and as a determinant of the world's price level may depend on the performance of the dollar. If the performance of the dollar improves, gold may be dethroned even if its use as a reserve asset continues. Failure of the dollar to perform in a stable fashion in the future leaves open the possibility of a restoration of a significant role for gold.

2

Summary

The United States adopted a de facto gold standard in 1834. Thereafter, it adhered to some form of a gold standard with only

two extended interruptions, once for 17 years in the 19th century, and again in this century, for 13 years, if one dates the interruption from 1968, when the two-tier London gold market was created; for 10 years, if one dates it from 1971 when convertibility of the dollar, even for official transactions, was formally suspended; for 8 years, if one dates it from 1973, when floating exchange rates were formally adopted by the United States and the Western industrial countries. The political objective of returning to the gold standard was achieved in the 19th century case, despite opposition from silver and paper money advocates. Whether that political objective is currently achievable cannot be determined from a retrospective view.

In addition to the two extended interruptions in U.S. adherence to a gold standard, temporary suspension of a few weeks to a year's duration occurred in 1837, 1839, 1857, 1893, 1907, 1917-19, and 1933. In all cases but the latter two, the years in question climaxed periods of economic expansion in the United States, fostered by external as well as internal factors. The pace of the expansions raised U.S. prices and incomes above those prevailing in the rest of the gold standard world. To bring the U.S. price and income structure into alignment with that of its trading partners enforced reductions in the U.S. money stock, usually resulting from a decline in U.S. gold reserves and in

capital imports from abroad. Prices, output, and employment subsequently declined, accompanied by bankruptcies of firms and bank failures. Suspension of specie payments in the years under review was a means of mitigating the costs of deflationary adjustment that maintaining par values of the exchange rate imposed. The devaluation implicit in suspension gave the economy a breathing spell. With recovery, the former par value of the exchange rate was restored.

No special comment is needed on the World War I restriction of interconvertibility between paper money and gold and the free international movement of gold. The situation in 1933, however, does require comment. That year was in no respect similar to the earlier examples of temporary devaluations. 1933 was a year of a business cycle trough after four years of deflation. The deliberate reduction in the gold content of the dollar was arranged to achieve a price rise of nongold commodities, and the devaluation was never reversed. Moreover, the fixed exchange rate gold standard to which the United States returned in 1934 was the same in name only as the pre-1933 gold standard.

Before 1914, gold flows in and out of the United States determined the expansion or contraction of the economy. Between 1919 and 1933, large outflows of gold occasioned contractionary actions by the monetary authorities; small outflows and inflows

of gold, whether large or small, were sterilized. After 1934, both inflows and outflows were not permitted to determine monetary growth and the performance of the economy. When the gold reserve ratios applicable to Federal Reserve deposits and notes were close to the minimum legal requirement, the minimum was lowered and eventually abolished. Gold became a symbol rather than an effective constraint on the operation of the monetary authorities.

Figures 2-1 and 2-2 summarize the evidence on the performance of the economy; Figures 2-3 and 2-4, evidence on the purchasing power of gold, whether the gold standard was suspended or in effect.

Trend movements in prices are the most striking feature of Figure 2-1. From 1834 to 1861, a mild downward trend prevailed, with pronounced cyclical upswings and downswings around the trend. The greenback period from 1862 to 1878 shows the sharp wartime price rise to 1865 followed by a decline of equal magnitude spread over the years to the close of the period. That decline persisted during the gold standard period to 1896, reflecting the disparity between the rate of growth of the monetary gold stock and the enlarged world demand. The reversal of the downward trend from 1896 to 1914 reflects the dramatic increase in world gold output during that period. World War I, like the Civil War period, shows a steep price increase to 1920,

followed by the steep price decline from 1920 to 1921, rough stability during the 1920s, and then the great deflation of 1929-33 that restored the wholesale price series to its pre-World War I level, the implicit price deflator to a somewhat higher point than the pre-World War I level. The contraction of 1937-38 is apparent in the post-1933 upswing which continues into and beyond World War II. The wholesale price series shows rough stability in the early 1960s, whereas the implicit price deflator continues an upward movement. Both series accelerate after the mid-1960s.

Figure 2-2 plots the deviations of real per capita output from its long-run trend. The trend has been strongly positive from 1870 to 1980, as might be expected. There was substantial variance about the trend before 1914 but far smaller in magnitude than from 1914-47, reflecting the sharp swings in the three interwar deep depressions, 1920-21, 1929-33, 1937-38, as well as the wartime movements. However, the pre-World War I variance was marginally greater than the variance of the deviations from trend post-1948. A comparison of the standard deviations of year-to-year percentage change in real per capita income also shows little difference between the pre-World War I gold standard experience and post-World War II experience: 5.8 per cent vs. 5.5 per cent. Unemployment was on the average lower in the pre-1914 period than in the post-World War I period; 6.8 per cent vs. 7.5

per cent. But again, excluding the interwar years, unemployment 1946-80 averaged 4.8 per cent, reflecting the government's commitment to maintaining employment.

Figure 2-3 compares the purchasing power of gold, derived in index form from the quotient of the price of gold divided by the wholesale price index, compared with the U.S. monetary gold stock. Under the gold standard, a rise in the purchasing power of gold ultimately increased the growth of the U.S. monetary gold stock by raising the rate of world gold output, and inducing a shift from nonmonetary to monetary use of gold. Movements in the purchasing power of gold thus preceded long-term movements in the monetary gold stock. This relationship underlay the reversion of the price level towards stability under the gold standard. Price increases or decreases tended to be reversed after a run of years. Persistent inflation of post-World War II experience, without a force to reverse the trend, could not have occurred under a fully functioning gold standard. The absence of this positive association after World War II between the purchasing power of gold and long-term movements in the monetary gold stock reflects the loosening of the link between the money supply and the gold stock.

Over shorter periods, the relationship under the gold standard was in the opposite direction. Changes in the monetary gold

stock, by influencing changes in the money supply, produced a negative association between the purchasing power of gold and the gold stock. Thus an increase in the gold stock would lead to an increase in the price level and, for a given nominal price of gold, lower the purchasing power of gold. The negative association may be observed during the gold standard period, changes in the monetary gold stock leading short-term movements in the purchasing power of gold.

Figure 2-4 compares the exchange value of money, computed as the reciprocal of the wholesale price index, with the purchasing power of gold. The two series are closely related until 1968, when the two-tier market for gold was introduced. The direct relationship until 1968 reflected the existence of a fixed nominal price of gold. The inverse relationship thereafter reflects the increase in private demand for gold as a hedge against inflation and political instability, once private transactions were determined in the free market.

To conclude: The gold standard provided long-term but not short-term price predictability. Long-term inflation or deflation under the pre-World War I gold standard would predictably be reversed as gold output was discouraged or encouraged by decreases or increases in its purchasing power. Thus the price level tended to revert toward a long-run stable value under the

Figure 2-4
The Exchange Value of Money (1972=100) and
the Purchasing Power of Gold (1972=100)



gold standard, providing a degree of predictability with respect to the value of money. Subsequent to World War I, the discipline of the gold standard came to be regarded as an impediment to the management of the economy to achieve the objectives of growth and high employment. The deep depressions of the inter-war years were the measure by which the economy under a gold constraint was judged to be a failure. The loosening of the link to gold after World War I and its abandonment fifty years later reduced long-term price predictability. Belief in long-term price stability eroded as public perception of the absence of a long-run constraint on monetary growth took hold. Although price stability was generally included among the goals of the post-World War II era, in fact stability of employment took precedence. In the event, by 1981, neither goal was in sight.

Chapter 2Notes

1. Act of April 2, 1792, sec. 9, in National Monetary Commission Laws of the United States Concerning Money, Banking, and Loans, 1776-1900 [Laws], Washington: Government Printing Office, 1910, p. 475.
2. J. I. Laughlin, The History of Bimetallism in the United States, 4th ed., New York: Appleton, 1901, pp. 51, 57.
3. Laws, p. 406.
4. Laughlin, op. cit., pp. 64-71.
5. Act of January 12, 1837, in Laws, p. 502.
6. Laughlin, op. cit., p. 77.
7. Laws, p. 512. The Act of Feb. 21, 1853, states the standard weight of silver in a 50-cent coin as 192 grams, which is equivalent to 172.8 grams per one-half a fine troy ounce.
8. Laws, p. 508.
9. Laws, p. 574.
10. Laughlin, op. cit., pp. 118-20; J. F. Cairnes, Essays in Political Economy: Theoretical and Applied, London: Macmillan, 1877, p. 142.
11. George Macosich, "Sources of Monetary Disturbances in the U.S., 1834-1845," Journal of Economic History 20 (September 1960):

- 407-34; Peter Temin, The Jacksonian Economy, New York, Norton, 1969, pp. 28-82, 138-39.
12. R. H. Timberlake, Jr., The Origins of Central Banking in the United States, Cambridge, Harvard University Press, 1978, Ch. 5 "The Specie Circular and Distribution of the Surplus," pp. 50-6
Temin, op. cit., pp. 120-136.
13. Temin, op. cit., 113-20; 141-47.
14. Bray Hammond, Banks and Politics in America from the Revolution to the Civil War, Princeton, Princeton University Press, 1957, pp. 707-17.
15. U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 1, Series E-52, p. 201.
16. These are unpublished partial estimates of GNP in 1860 prices, referring to Census years (June 1 to May 31), constructed by Robert E. Gallman. The estimates are partial because they do not include the change in inventories. It is for this reason that the annual rates of change do not show the cyclical movements of the economy. Those movements are dominated by change in inventories. An alternate real income series, in 1929 prices, is available in Thomas Senior Berry, Estimated Annual Variations in Gross National Product, 1789 to 1909 (Richmond, Bostwick Press, 1968). Annual rates of change of these estimates (shown there in Table 1, col. 3, p. 32) are: 1834-37 (+5); 1837-38 (-1); 1838-56 (+4.6); 1856-57 (-8); 1857-59 (+6).

17. This section draws heavily on Milton Friedman and Anna J. Schwartz, A Monetary History of the United States, 1867-1960 [History], Princeton, Princeton University Press, 1963, pp. 45-88.
18. Report and Accompanying Documents of the United States Monetary Commission Organized Under Joint Resolution of August 15, 1876 [44th Congress, 2d Sess., Senate Report No. 703], Washington, G.P.O., 1877, vol. 1, pp. 1-160.
19. Timberlake, op. cit., Ch. 8, "The Panic of 1873 and Resumption," pp. 108-119.
20. See Friedman and Schwartz, History, pp. 89-188.
21. Sources of wholesale prices: 1800-1889, U.S. Bureau of the Census, Historical Statistics, Series E-52, pp. 202-203, shifted from 1910-14 to 1972 base; 1890-1970, ibid., Series E-23, p. 199, shifted from 1967 to 1972 base; 1971-1979, U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, December 1980, Bulletin 2070, Table 140, p. 334, shifted from 1967 to 1972 base; 1980, Survey of Current Business, August 1981, pp. 5-7, producer prices, all commodities, shifted to 1972 base.
22. Source of monetary gold stock: 1875-1878, Phillip Cagan, Determinants and Effects of Changes in the Stock of Money, 1875-1960, New York, Columbia University Press for NBER, 1965, Table F-7, p. 340; 1879-1913, Friedman and Schwartz, History, Table 5,

col. 1, p. 131, Table 8, col. 1, p. 180; 1914-41, Board of Governors of the Federal Reserve System, Banking and Monetary Statistics, 1914-1941, 1943, p. 536, plus \$237 million deducted by the source restored annually 1914-33, and 1934-41 figures recalculated at \$20.67 per ounce instead of at \$35; Banking and Monetary Statistics 1941-1970, p. 899, recalculated; 1971-1980, Federal Reserve Bulletin, Dec. 1976, p. A59, Dec. 1978, p. A55; Aug. 1981, p. A53, recalculated. Purchasing power of gold: Table A-1 in Appendix to Chapter 4, below.

23. Sources of real per capita income: Milton Friedman and Anna J. Schwartz, Monetary Trends in the United States and the United Kingdom, 1867-1975 (in press), Ch. 4, extended 1976-80, in the same way as the figures were constructed for preceding years.

An alternative series that was discussed at one of our meetings is a Bureau of Labor Statistics series of real net spendable weekly earnings of a worker with three dependents. This series diverges markedly from 1962 on from a series of real per capita disposable personal income, showing a progressively steeper decline that does not characterize the real per capita disposable personal income series (or the real per capita income series).

As an article by Paul Ryscavage, "Two divergent measures of purchasing power," Monthly Labor Review, Aug. 1979, pp.

25-30, explains, the real earnings series is a faulty measure. It is constructed from estimates of average hourly earnings and average weekly hours of both full-time and part-time workers. The two estimates are multiplied to obtain average weekly earnings. From the gross average figure, the PLS deducts the social security tax and the Federal income tax liability applicable to a married worker with three dependents. The Consumer Price Index is then divided into the net spendable earnings to arrive at real net spendable earnings.

The key problem with the series is the measure of gross average weekly earnings. It includes not only weekly earnings of men, the majority of whom work full time, but also the weekly earnings of women and teenagers, many of whom work part time. The earnings of the latter two classes of workers pull down the overall average for production and nonsupervisory workers.

Since the series of real net spendable weekly earnings of a worker with three dependents is not based on earnings data for a worker with these characteristics, it does not provide a reliable measure of his economic well-being, as the PLS acknowledges.

At the Hearings we conducted on November 13, Professor

Roy Jastram suggested that "the use of real per capita income as a measure of the comparative fluctuations in the economy with and without the gold standard" was misleading.

Specifically, he argued that unionization of labor and the growth of transfer payments since 1934 tended to diminish declines in real per capita income thereafter. Since transfer payments do not raise aggregate real incomes, it is hard to see why per capita results would be affected.

Unionization might have increased instability insofar as it reduced income for those not covered by unions. In any event, we reject Professor Jastram's suggestion that manufacturing production is a more even-handed measure of the severity of cyclical movements in both gold standard and post-gold standard periods. Since manufacturing production has declined relative to aggregate GNP, it is a biased measure of economic well-being over the past half century.

24. Friedman and Schwartz, History, pp. 189-406.

25. Ibid., pp. 462-71.

26. Ibid., pp. 471-76; 508-11; 550-51.

27. Arthur I. Bloomfield, Capital Imports and the American Balance of Payments, 1934-39, Chicago: University of Chicago Press, 1939, pp. 158-66.

28. During the first nine months of 1937, the Treasury did

not use the cash balances it could create on the basis of the gold it bought. Instead, it paid for the gold by borrowing from the public and the banks. What the Treasury took from the public and the banks by the sale of securities offset what it paid to the public and the banks by the purchase of gold. Accordingly, high-powered money did not reflect the growth of the gold stock.

The operation was economically identical with the sterilization actions of the Federal Reserve in the 1920s, when the System sold bonds on the open market to offset the increase in high-powered money that would otherwise have arisen from a gold inflow. The Treasury program became effective at about the same time the Federal Reserve was imposing two increases in reserve requirements on member banks (on March 1 and May 1, 1937; an earlier increase was imposed in August 1936). The sterilization program sharply reinforced the effect of the rise in reserve requirements in producing monetary restrictiveness: the rise in reserve requirements increased the demand for high-powered money; simultaneously the Treasury's action virtually brought to a halt an increase in high-powered money which had been proceeding with only minor interruptions since 1933.

A start toward desterilization was made in September

1937, when the Board of Governors of the Federal Reserve System requested the Treasury to release \$200 million from the inactive gold account. The Treasury released the amount requested by the Federal Reserve, but it continued to sterilize all further gold purchases, which amounted to \$170 million in that month. Hence inactive gold held by the Treasury fell only \$126 million in September 1937.

As of January 1, 1938, the Treasury limited the addition to the inactive gold account in any one quarter to the amount by which total gold purchases exceeded \$100 million, and on April 10, 1938, discontinued the inactive gold account, which then amounted to about \$1.2 billion. In the first half of 1938, accordingly, there was a more rapid increase in high-powered money than in the gold stock. The Treasury printed gold certificates corresponding to some of the inactive gold in the Treasury, deposited the certificates at the Reserve Banks, and drew on the balances it thus established to pay government expenses or to redeem debt. The operation was essentially an open market purchase of securities undertaken at Treasury initiative.

Initially, the shift of inactive gold from Treasury cash to Treasury deposits at the Federal Reserve Banks had no immediate monetary effect. Effective desterilization did not

occur until more than a year after formal desterilization. Only after February 1939 did the sum of Treasury cash holdings and deposits at Reserve Banks decline toward the level that had prevailed before the sterilization program.

29. This section draws heavily on Chapter 2 of The International Transmission of Inflation (in press) by M. R. Darby, J. R. Lothian, A. E. Gandolfi, A. J. Schwartz, and A. C. Stockman.
30. See "Treasury and Federal Reserve Foreign Exchange Operations," in Federal Reserve Bulletin, Sept. 1962, pp. 1138-53.
31. Margaret G. de Vries, The International Monetary Fund 1966-1971: The System Under Stress, Washington, D.C. 1976, Part Five, "Exchange Rates in Crisis," pp. 432-48.
32. For a description of the controls that were imposed, see International Monetary Fund, Annual Report on Exchange Restrictions, various editions.
33. Lance Girton argues that the emphasis upon international liquidity during this period and the subsequent introduction of SDRs stemmed from the application of the real-bills doctrine to the international monetary system. See his "SDR Creation and the Real-Bills Doctrine," Southern Economic Journal 41, July 1974, pp. 57-61. The real-bills doctrine is the notion that if banks restricted their advances to the nominal value of trade, the money supply would have a desirable

elasticity. In fact, it would become unstable. The fallacy in the doctrine is that it sets no effective limit to the quantity of money.

34. By the end of the fourth quarter of 1972, the value of SDRs was slightly over \$9.4 billion or 6 percent of total world international reserves as reported in International Financial Statistics, July 1974.
35. IMF, Annual Report, 1975, p. 44.
36. See Annual Report of the Secretary of the Treasury on the State of the Finances, 1979, p. 491, Exhibit 60, a press release on the increase in the amount of gold sales, announced Aug. 22, 1978 ("The sales will make an important contribution toward reducing the U.S. balance of payments deficit on current account") and Exhibit 61, a statement by Assistant Secretary Bergsten before the Senate Committee on Banking, Housing and Urban Affairs, in which the quotation in the text appears. See also A.E. Burger, "The Monetary Economics of Gold," in Federal Reserve Bank of St. Louis Review 56 (January 1974):
37. Only \$42.22 of the price obtained for every ounce the Treasury auctioned was applied to the retirement of gold certificates. The balance was applied to the Treasury's General Fund.
38. Board of Governors of the Federal Reserve System, 61st Annual Report, 1974, pp. 65-66.
39. The first guideline stated: "A member with a floating exchange rate should intervene on the foreign exchange market

as necessary to prevent or moderate sharp and disruptive fluctuations from day to day and from week to week in the exchange value of the currency." A second guideline encouraged intervention to moderate movements from month to month and quarter to quarter "where factors recognized to be temporary are at work." A third guideline suggested consultation with the fund if a country sought to move its exchange rate "to some target zone of rates." A fourth guideline dealt with the size of a country's reserves relative to planned intervention; a fifth, with avoiding restrictions for balance of payment purposes; a sixth, with the interests of other countries than the intervening one. IMF Annual Report, 1974, pp. 112-116.

40. The index of weighted average exchange values of the dollar against the "G-10" countries plus Switzerland (March 1973=100) declined at an average annual rate of 9.3 percent between January and November 1978. From January 1976 to January 1978, it had declined at a 3.3 percent annual rate.
41. The price of gold from the end of 1973 to the end of 1980 increased at an average annual rate of 20.7 per cent. By comparison, the total returns on common stock and on long-term corporate bonds increased at average annual rates of 7.2 per cent and 4.0 per cent, respectively. (These figures

appear in F. G. Ibbotson and F. A. Sinquefeld, "Stocks, bonds, bills and inflation: Year-to-year historical returns (1926-1971)"; "Simulations of the Future (1976-2000)" in Journal of Business 49, Jan. 1976, pp. 11-47, and July 1976, pp. 313-338.) The U.S. CPI over this period increased at a rate of 7.8 per cent per year on average and the London Economist's world commodity price index increased at a 9.5 per cent rate.

Report of the Gold Commission

Introduction

Establishment of the Commission

We, the members of the Gold Commission, were appointed by Secretary of the Treasury Donald T. Regan on June 22, 1981, pursuant to section 10(b) of Public Law 96-389 (94 Stat. 1555), to "conduct a study to assess and make recommendations with regard to the policy of the U.S. Government concerning the role of gold in domestic and international monetary systems." The Commission was directed to transmit its report to Congress no later than October 7, 1981, 1 year after the date of enactment. Due to the change in administration and the delay in appointment of members, it was not until July 16, 1981, that we met for the first time. We were in general agreement that a satisfactory report could not be prepared by the October 7 date. Accordingly, we requested an extension of the Commission's life. Legislation to that end was introduced in the Congress and enacted as P.L. 97-47 on September 30, 1981. The date for the report of the Commission was thereby changed to March 31, 1982.

Hearings on the Role of Gold

We held 10 meetings, at 2 of which we heard testimony concerning gold from 23 witnesses. They commented on the use and effectiveness of gold in past domestic and international monetary systems, and offered varying proposals for a restored role for gold, or favored the continuation of the present system with no

role for gold.

In addition to the hearings, the Treasury Department invited written statements on the role of gold from organizations and individuals. Summaries of the testimony we heard and of the statements submitted to us are reproduced in an annex to the Report.

Contents of the Report

The body of our Report reflects the range of issues we discussed during our deliberations.

Chapter 1 surveys economic developments of recent years that were the background to the establishment of the Gold Commission. What distinguishes the period since the mid-1960's is rising and persistent inflation without precedent in peacetime in the United States. Public attention to the activities of the Commission reflects a desire for some institutional arrangements to ensure price stability. The chapter presents the factual record of the performance of the economy, and reviews explanations that have been offered to account for the lack of success of several attempts to curb inflation in the decade and a half from 1965.

Chapter 2 examines the historical evidence on the experience of the United States with gold. In 1834, though legally on a bimetallic standard, de facto the United States adopted a gold standard. The chapter deals with successive changes since then in the character of our country's monetary system, down to the most recent decade of inconvertible paper money, and attempts to account for the changes.

In Chapter 3, we explore the strengths and weaknesses of alternative monetary standards, including different versions of a gold standard, commodity standards other than gold, and the present inconvertible paper system. International aspects of the alternative standards receive attention.

In Chapter 4, we review the current role of gold and consider possible changes. In relation to domestic monetary arrangements, the changes would affect the conduct of Treasury or Federal Reserve operations or both. Such changes, if adopted, would also affect private sector conduct. In relation to the international monetary system, the changes would affect foreign exchange rate arrangements, the settlement of the balance of payments, or the International Monetary Fund.

For each possible change in the current role of gold, we discuss the main elements of the change, transitional problems, if any, potential legal and international implications, and assess the advantages or disadvantages it presents.

An appendix to Chapter 4 brings together material on the historical market for gold that was dominated by central banks until 1968, and on the demand for and supply of gold in the free market for gold that has since come into existence. In addition, the appendix provides a retrospective view on the record of gold production over past centuries, its relation to trend movements in commodity prices, and the allocation of the stock of gold between monetary and nonmonetary uses. A statistical compendium gives time series of world and U.S. production and stocks of

gold, world and U.S. industrial use of gold, and the nominal and real price of gold.

Aims of the Gold Commission

Part of our mandate is to assess the role of gold in the domestic and international monetary systems. To assess means "to analyze critically, and judge definitively the nature, significance, status, or merit of" a subject -- in our case, the role of gold. We decided that the best service we could render the country would be to set forth in an objective way the complex issues involved and give a fair hearing to different points of view.

Assessments differ among members of the Commission not only with respect to the costs and benefits in the past when our monetary system was linked to gold but also with respect to the prospective costs and benefits, were such a link restored. Given the size of the Commission that the Congress specified, and the diversity of our views, that result may not be surprising.

Another part of our mandate is to make recommendations. Though it became apparent to us during our deliberations that we would not be able to achieve a unanimous set of recommendations, on some issues, it was possible to form majorities. Even so, a majority vote in favor of a specific recommendation did not signify that all so voting had the same purposes and/or interpretations in mind. Moreover, if each of us had been reporting singly instead of as one of a body of colleagues, individual members would not necessarily have expressed themselves in

precisely the way the recommendations are stated. Differences in wording, emphasis and perceptions would have been evident. In some instances our recommendations touch on technical matters, such as legal and tax considerations, that need to be studied more exhaustively than it has been possible for us to do. Such technical questions should be given attention in any Congressional hearings in connection with our recommendations.

Majority and Minority Recommendations

We report our recommendations on the following subjects:

1. The program of Treasury medallion sales
2. Treasury issue of gold bullion coins
3. Treasury issue of gold-backed notes or bonds
4. The gold stock owned by the United States
 - a. The public accounting for the gold stock
 - b. The relationship between gold certificates held as an asset of the Federal Reserve System and the gold held by the Treasury
 - c. The appropriate size of the gold stock
 - d. The price at which to value the gold stock
 - e. Managing the gold stock
5. Domestic monetary policy arrangements
6. International monetary policy arrangements

With respect to most of these subjects, we first present majority views and then the minority views, with some discussion of the opposing reasons that were expressed in our deliberations.

1. The program of Treasury medallion sales

In July 1980, the Treasury began the sale of half-ounce and one-ounce gold medallions in accordance with the American Arts Gold Medallion Act of November 10, 1978 (PL 95-630). The legislation provided that not less than 1 million ounces of gold be struck into medallions each year for a five-year period and sold to the public at a price covering all costs. A different American artist is commemorated on each of the two sizes of medallions. In 1980, Grant Wood was honored on the one-ounce and Marian Anderson on the one-half ounce medallion. In 1981, Mark Twain was honored on the one-ounce and Willa Cather on the one-half ounce medallion. Under the 1980 program covering the period July 15, 1980, through February 28, 1981, less than 300 thousand medallions of each size were sold, amounting to 434 thousand gold ounces. Under the 1981 program from July 15, 1981, through November 16, 1981, about 40 thousand medallions of each size were sold, amounting to 61 thousand gold ounces.

The price of the medallions varies daily with the market price of their gold content, based on the settlement price at the end of the previous day for gold traded on the Commodity Exchange of New York, plus a surcharge in 1981 of \$14 per ounce to cover the cost of production and marketing.

The Bureau of the Mint sells the medallions directly to purchasers through mail orders placed at U.S. post offices. Delivery is made weeks later.

The Treasury Department is planning a simpler and wider

distribution of the medallions to be introduced this year through a network of dealers. Although details are not yet finally decided, the expectation is that sales to dealers will be made on the basis of the daily New York gold price, plus a 3 per cent markup to cover costs including advertising by the Mint. The dealers would add a comparable fee in selling to the public and develop a secondary market for the medallions.

Recommendation. The Gold Commission supports the improvement of the program of medallion sales that the Treasury plans.

2. Treasury issue of gold bullion coins

In addition to gold medallions we discussed proposals for a Treasury issue of gold bullion coins of specified weights to be offered to the public at a price near market value.

Among those who support the proposal, two conceptions of the character of the demand for such coins are evident. Some of us expect the demand for such coins to be an investment demand, similar to the demand for krugerrands, maple leaves, Mexican pesos, and other foreign coins that have found a market in this country. Others expect the demand for such coins to be (or has the potential to be) a demand for their use as money. Their value would change from day to day as the gold content value of coin fluctuated in the free gold market.

Some advocates of this proposal see these coins as facilitating development of a dual monetary system, which would provide a degree of discipline to discretionary monetary policy in the country.

However, those opposing the proposal believe that ample supplies of gold in forms other than Treasury coins are available to satisfy the demand for gold in the private sector.

To compete with foreign coins, some proponents advise that the new issues be designated legal tender and as coin of the realm bearing the great seal of the United States, the motto "In God We Trust." In addition, they advise that changes in the dollar value of these coins should be exempt from capital gains taxation.

A number of questions related to a Treasury issue of gold bullion coins should receive detailed examination.

(a) Consideration of a quantity or a price limit on the issue of the coins. This reflects concern that the demand for the coins might exhaust the Treasury gold stock. The medallion legislation specifies a limited number of ounces of gold that may be struck into medallions. A similar limit should be considered if legislation to permit coinage is approved.

An alternative means of limiting the demand would be to set a seignorage fee well in excess of costs of minting.

Some who believe the demand for coins is a demand for money oppose a limit. They would view large scale demand as an indication of public dissatisfaction with the management of the (dollar) money supply and as leading to de facto establishment of a gold coin standard. According to this view, establishment of an arbitrary limit would interfere with this expression of public preferences. A few others of both persuasions favor Treasury

purchases of gold to replace gold it has coined. Those who believe the demand for coins is an investment demand assume that it would not be quantitatively significant, and on this ground would neither oppose nor support a legislated limit.

(b) Enabling legislation to mint coins. Section 5 of the Gold Reserve Act (31 U.S.C. sec. 315b) prohibits the minting of gold coin for domestic purposes.

(c) The implications of legal tender status for newly minted coins. Treasury Counsel prepared for us a statement on this matter related to U.S. currency (see annex 1 to this chapter).

For some who regard the demand for coins to be an investment demand, legal tender status is an adornment for coins, but nevertheless a sine qua non for generating public acceptance of them.

For some who regard the demand as a demand (or a potential demand) for money, the implications of legal tender status require further consideration. Absent contract provisions to the contrary, a creditor is bound to accept "legal tender" in satisfaction of the amounts due him. Legal tender status for gold coins could compel their acceptance by private creditors or the Treasury in satisfaction of taxes. Formidable problems, involving potential profits and losses to private creditors and debtors, could arise in assigning gold coins legal tender status at market value.

(d) The implications of capital gains exemption for changes in the dollar value of coins. What are the consequences of advo-

cating such exemption for coins but not for gold bullion holdings or, for that matter, not for productive investments ? Would legislation to prohibit local government imposition of sales taxes also be required?

(e) Issues by private mints. S. 1704 and H.R. 3789 specify Government coinage of a 5-gram, a 10-gram, a one-troy-ounce-gross and one-troy-ounce-net goldpiece. One-half by aggregate weight of all government-manufactured coins would be the small denominations. In addition, the bills authorize private mints to manufacture gold coins of any size with anyone's picture on its face to circulate as lawful money. The majority of us oppose private minting of official United States coins. We regard the production of "official" coins of a country as a governmental function. The government in effect guarantees the weight and fineness of the "official" coins issued. Private firms are perfectly free to mint gold pieces of any shape and size, so long as they do not purport to be United States coins with a U.S. Government guarantee of weight and fineness. Permission for private firms to mint U.S. coins would open possibilities for fraud and could involve the Treasury in a new and costly regulatory and monetary function. Problems would be compounded if the Treasury had a convertibility obligation or an obligation to accept the coins in payment of taxes.

(f) Convertibility at Treasury of gold bullion coins. Of those favoring issue of coins, about half support assumption by the Treasury of an obligation to stand ready to purchase coin offered

to it at the market price on the day of redemption, the conversion producing profits (or losses) for the Treasury. The bills mentioned above do not contain an explicit provision for convertibility but provide for use of Federal Reserve liabilities tendered in exchange for gold bullion coins to reduce the national debt.

Majority Recommendation. We favor Treasury issue of gold bullion coins of specified weights to be sold at a small mark-up over the market price of the gold content, and recommend that the Congress request from the Treasury an analysis of the ways in which this proposal might be implemented.

Minority Recommendation. We oppose Treasury issue of gold bullion coins.

3. Treasury issue of gold-backed notes or bonds

Several witnesses at the hearings we conducted suggested that Treasury issue of gold-backed notes or bonds would be a means of introducing gold into our monetary system. A limited issue, for example, of five-year Treasury notes with interest and principal payable in grams or ounces of gold, would provide deferred claims to gold. Successive issues in terms of gold would eventually become demand claims on gold. Initially, according to the advocates, the yield spreads between gold and inconvertible dollar obligations of the same maturities might be wide. Success in restoring long-term confidence in monetary discipline would eventually narrow the yield spreads. At that time, full gold convertibility of all dollar obligations might be contemplated.

These witnesses emphasized the savings on interest payments by the Treasury, assuming the price of gold remained stable or rose only moderately, and hence a positive effect on Federal budget deficits.

In our deliberations, it was noted that a gold-backed Treasury note or bond, if convertible at maturity at the market price of gold at the date of issue, would in effect be a warehouse certificate for gold. Such an instrument would provide the owner the same chance of gain or loss as owning gold, without his incurring the cost of storage and insurance. No obvious guideline exists for pricing the instrument. Treasury issue of gold-backed notes or bonds, paying even a low rate of interest, would permit speculation on gold with a sweetener of a coupon. Such issues would be comparable to a bond convertible into the common stock of a corporation that has a low coupon because of the possibility of speculative gain. Purchase of Treasury gold-backed issues would indicate an expectation that the price of gold would rise. The Treasury would then be betting against the market, with no assurance of gain and a major risk of Treasury losses. From a debt management viewpoint, no need exists for gold-backed Treasury issues.

Majority Recommendation. We oppose the issue of Treasury gold-backed notes or bonds as prejudicial to the national interest.

Minority Recommendation. The Treasury should consider issuing gold-backed notes or bonds with a low coupon as a way of reducing

interest payments on the public debt and thus current budget deficits.

4. The gold stock owned by the United States Government

As of March 1982, the Treasury Department reported that it held 264 million troy ounces of gold. The bulk of the gold is stored in five mint depositories: Fort Knox, Kentucky; U.S. Assay Offices in New York and San Francisco; and the Denver and Philadelphia Mints. In addition, the Federal Reserve Bank of New York is the custodian of a part of the gold stock.

a. The public accounting for the gold stock

Citizens have written to us expressing concern about alleged unauthorized large withdrawals from gold depositories. They fear that the actual amounts held by the Government are less than are reported officially. Stories in the press also have referred to missing gold.

Public and Congressional inquiries relating to the accuracy of the accounting records and security of the gold stock were directed to the General Accounting Office (GAO) in the early 1970s. In response, the GAO conducted a partial audit of the gold bars stored at Fort Knox in September and October 1974. In its report on the audit, the GAO recommended cyclical audits of the gold in the custody of the Bureau of the Mint.

During fiscal 1975, the Fiscal Assistant Secretary of the Treasury established the Continuing Committee for the Audit of U.S.-Owned Gold stored at various depositories, with the responsibility to conduct audits at appropriate intervals. The

Committee consists of one representative each from the Bureau of the Mint, the Bureau of Government Financial Operations, and the Federal Reserve Bank of New York, with GAO representatives invited to observe the audits. As of September 1981, 79.1 percent of the U.S.-owned gold had been audited and verified. The continuing audit program is planned to provide a complete audit of all U.S.-owned gold by the end of the 10-year cycle in 1984.

The Treasury has provided us with a detailed statement of the results of the continuing audit (see annex 2 to this chapter). A majority of us are satisfied with the Treasury's continuing audit, find it thorough, and believe it should allay any public concern with regard to the accuracy of the inventory, the related accounting records, and the internal controls governing the depositories. One of us, however, expressed a preference for a speedier completion of the audit.

A minority is not satisfied with an audit that spans ten years and contends that 31 U.S.C. 354 appears to require annual audits of the gold inventory. The minority disputes the Treasury's claim that a 100 percent audit in a single year is not feasible, since on its own estimate of manpower requirements, 26 people could do it. The Treasury has provided us with an opinion that 31 U.S.C. 354 requires not annual audits but annual settlements of account, which are being performed regularly in compliance with this provision.

Majority Recommendation. We are satisfied that the Treasury is meeting the requirements of 31 U.S.C. 354 regarding annual settlements of account and that the Treasury's continuing audit of the Government-owned gold stock, when completed in 1984, will provide

full verification of the accuracy of inventory records.

Minority Recommendation. The Treasury should assign adequate manpower to complete a 100 percent audit of the gold stock every year.

b. The relationship between gold certificates held as an asset of the Federal Reserve System and the gold held by the Treasury

Some citizens have expressed the view that for the Treasury to claim ownership of the gold stock and the Federal Reserve System to show gold certificates as assets appears to be double-counting of the same asset.

The gold is the property of the U.S. Government. The certificates do not represent Federal Reserve ownership of the gold.

Gold certificates, which are valued at \$42.22 per ounce of gold, are issued to the Federal Reserve by the Treasury against its gold holdings. The certificates represent Federal Reserve claims on the Treasury, which are liquidated by Treasury dollar payments to the Federal Reserve.

As all gold held by the Treasury has been monetized in this fashion, the Federal Reserve Banks' gold certificate account represents the nation's entire gold stock. New gold certificate credits may be issued only if additional gold is acquired by the Treasury or the statutory price of gold is increased. Similarly, gold certificate credits must be retired by the Treasury upon the sale of gold, with a corresponding decline in the Treasury's deposit balance.

Recommendation. We believe that the Treasury and Federal Reserve are following appropriate procedures in reporting Federal Reserve

claims on the Treasury represented by gold certificates and payable in dollars.

c. The appropriate size of the gold stock

At year-end 1949, the U.S. gold stock was a little over 700 million fine troy ounces. At year-end 1967, the stock was about 50 per cent smaller -- 345 million ounces. As already noted, it is now 264 million ounces.

One question we discussed was the appropriate size of the gold stock -- a non-earning asset of the Treasury. All of us agree that a zero stock is not the appropriate size and therefore oppose auction sales which are intended to dispose of Treasury holdings over some stated period of years.

A minority prefers that the Treasury maintain the present stock as an important strategic and monetary resource. The view is consistent with the belief that an increase in the monetary role of gold is not now timely but the stock should be held as a reserve for possible future use, should a restored role for gold then appear feasible, or against other contingencies. In support of this view, it was suggested to us that should an international monetary conference of free world nations be convened to recommend changes in the international monetary system, it would be useful for the United States to hold a substantial gold stock to influence possible future deliberations and to be in a strong position if gold's role were reestablished.

A variant of that view, held by a majority of us, is that some depletion of the gold stock, for example, for the issue of

medallions or coinage, is acceptable but to a limited extent only.

Finally, some of us who favor establishing a gold cover requirement for the money supply believe that the appropriate size of the gold stock would depend on the size of the ratio of the gold cover requirement to the money stock. Pending that decision, no definite statement can be made but further study of the question would be in order should a gold cover requirement be adopted at some future date.

Majority Recommendation. We are opposed at this time to auction sales designed to dispose of the gold stock held by the Treasury and recommend that while no precise level for the gold stock is necessarily "right", substantial stocks should be maintained against various contingencies.

Minority Recommendation 1. We are opposed to auction sales of the gold stock held by the Treasury and recommend that the stock be maintained unchanged at its present size.

Minority Recommendation 2. Should a gold cover requirement be adopted at some future date, hearings should be held by the Congress to determine whether the existing gold stock is adequate in light of the proposed ratio of gold to the money supply.

d. The price at which to value the gold stock.

The Treasury currently values the gold stock it holds at \$42.22 per ounce. Since the free market in gold was established in 1968, the price has fluctuated between \$35 and \$850 per ounce. It is currently priced at under \$400 per ounce.

One argument for revaluing the gold stock at a price closer to the market price is that it would enable the Treasury to raise revenues by sale of part of its gold. The revenue could be used to retire debt, thus saving interest payments on outstanding Treasury securities, or to reduce the current Federal budget deficit.

Another argument is that it is unrealistic to value the gold stock at an outdated fixed price. Doing so distorts the true significance and cost of the U.S. gold asset position.

It was suggested to us that an advantage of valuing gold at the market is that it would once again become an accepted international medium for payment of balance of payments disequilibria, and that it could also be used for intervention purposes in foreign exchange markets to influence the exchange rate of the dollar.

We regard the choice of a price at which to revalue gold reserve assets as independent of a decision on the price at which to restore a gold standard. One proposal was made during our deliberations for a gradual increase in the statutory price of gold to a price closer to the market price. The proposal was incidental to a plan to require gold certificate reserves be kept behind Federal Reserve notes (see the testimony of Dr. Robert Weintraub in the annex to the report). No other proposal with respect to the determination of a price at which to revalue gold reserve assets was brought to our attention.

Majority Recommendation. We are opposed to revaluing the United

States gold stock at a higher price.

Minority Recommendation. We favor revaluing the United States gold stock at a higher price, the price to be increased annually by some moderate amount. We also recommend that the U.S. Treasury conduct a study of the valuation of official gold stocks and report its findings to the Congress with any formulas it deems appropriate for valuing gold at market-based prices. Only some of us favor the suggested uses of the revalued gold stock (see subject 6 below).

e. Managing the gold stock

One general proposition that we examined is the desirability of finding constructive uses of the gold stock rather than keeping it immobile, as is currently the case. Specific suggestions we considered included:

- (1) The United States should offer swaps, leases and make other commercial arrangements with respect to its gold stock in order to generate a modest revenue flow.
- (2) If revalued, gold should be used for intervention purposes in foreign exchange markets and for settlement of the balance of payments (see subject 4d. above).
- (3) The Federal Reserve System should engage in open market operations in the gold market as well as in the government securities market.

In our discussion of the general proposition, it was noted that the suggestions would tend to increase the demand for gold and thus raise its price. Yet there are grounds for the belief

that should the United States fix a price at which to restore the traditional gold standard, the price would have to be lower than the current market price (see Chapter 4). If the price in the market did not fall once the intention to fix it became known, that would indicate the market's skepticism that the price could be maintained. The sum of the suggested uses would inhibit, rather than promote, a return to the gold standard at a fixed price.

Moreover, if any of the suggested uses of gold yielded a profit, use of the profit to retire public debt or to spend it for budgetary purposes might encourage fiscal imprudence.

Majority Recommendation. We do not favor innovative uses of the gold stock, since the objectives sought by adding gold to the policy instruments of the monetary and fiscal authorities are attainable without such use and the side effects of so using gold may be undesirable.

Minority Recommendation. We favor innovative uses of the gold stock rather than maintaining it in immobile form.

5. Domestic monetary policy arrangements

Currently, transactions in gold are not used in the implementation of monetary policy by the Federal Reserve System. Gold certificates are carried as an asset of the Federal Reserve and therefore comprise one element in the sources of the monetary base. However, the Federal Reserve does not use its holdings of these certificates as a device for changing the base.

We considered a number of alternatives that would serve to

reintroduce gold into our domestic monetary policy arrangements. The objective would be to improve monetary control through the discipline of gold for the purpose of reducing inflation. Linking changes in the growth rate of money or of some component of money, such as Federal Reserve notes, or of bank reserves, to the change in the gold stock is one approach which was considered for imposing the discipline of gold.

One way to reintroduce gold would be to require the Federal Reserve System to maintain a minimum ratio of the U.S. Government's gold stock to the Federal Reserve monetary base (i.e. Federal Reserve notes plus bank reserves) or some monetary aggregate. A variant would fix upper and lower limits to the ratio, so that the System would be required to take expansionary actions when the ratio was at its upper limit, or contractionary actions when the ratio was at its lower limit. The gold cover requirement might be valued at the official price of \$42.22, or adjusted gradually, or allowed to fluctuate with market prices.

Along traditional gold-standard lines, the United States could define the dollar as a specified weight of gold (that is, fix the price of gold), set gold cover requirements for the Federal Reserve System, and allow the value of the gold stock to be determined by gold flows. If the value of the gold stock rose, the Federal Reserve would be required to undertake actions to expand the money stock. If the value of the gold stock declined, it would be required to take contractionary actions.

Since the decade of the 1970s, not only in the United States

but also in other industrialized nations, monetary authorities have experimented with self-imposed rules of conduct of monetary policy, sometimes expressed as target rates of growth of money. Long-term monetary discipline, not linked to gold, has been the objective. A variant of this approach would impose such discipline by legislative prescription, that is, a monetary rule.

Although some opposition was expressed to consideration of domestic monetary arrangements not linked to gold as overstepping the Gold Commission's mandate, in fact we discussed all the foregoing alternatives. In addition, we considered continuation of our present domestic monetary arrangements, under which the Federal Reserve exercises full discretion with respect to monetary actions and chooses the target rates at which it plans to increase different monetary aggregates, reporting to several Congressional committees both its plans and their results.

For most of us there were two problems in contemplating the feasibility of a return to a domestic gold standard. The primary one was the absence of a sound guide on how to determine the fixed dollar price of gold at which resumption of a gold cover requirement could be introduced. The secondary one was the absence of a sound guide on the extent of feasible convertibility of domestic dollar obligations.

Majority Recommendation. We favor no change in the present domestic monetary policy arrangements.

Minority Recommendation 1. We are opposed to a role for gold in

the domestic monetary system and favor a monetary rule governing the growth rate of the money supply to ensure a sustained reduction of inflationary pressures in the years ahead.

Minority Recommendation 2. We favor a role for gold as a cover for a monetary aggregate, the value of the gold cover to fluctuate with the market price.

Minority Recommendation 3. We favor the restoration of a gold standard with a fixed price of gold. It is the means to achieve discipline in the U.S. money base which will then increase or decrease with gold purchases and sales by the monetary authorities.

6. International monetary policy arrangements

We discussed a number of aspects of international monetary arrangements during our deliberations.

Under present conditions, the exchange rate of the dollar is determined in foreign exchange markets by the demand for and supply of dollars. The foreign exchange value of the dollar floats, changing from day to day as market influences (or government interventions) determine. We noted above in connection with subject 4d. that the majority of us oppose using monetary gold revalued at current market prices to intervene in foreign exchange markets.

Adopting a gold standard with a fixed price of gold in terms of dollars would fix exchange rates between the dollar and the currencies of its trading partners who also fixed the price of gold in terms of their currencies. Those who support a system of

fixed parities argue that it facilitates international trade and finance and, along with convertibility of the U.S. dollar to gold, would promote the goal of internal price stability.

Under present conditions, deficits or surpluses in our balance of payments are settled in dollars automatically. Even though dollars are not convertible into gold at a fixed price, they are convertible into U.S. goods and services including gold at market prices. Our trading partners continue to use dollars as an intervention currency in foreign exchange markets, in payments and receipts for international transactions, and as a reserve asset. We do not use our gold in payments and receipts for international transactions and neither do our trading partners.

Most of us believe that even if other countries with substantial gold stocks and the major gold-producing countries were to agree with us on a restoration of an international gold standard, the United States -- and the system as a whole -- would confront an as yet unsolved problem of the vast quantity of dollars world-wide with potential claims to gold convertibility. We are not in fact aware of international interest in restoring a gold standard.

One other question we discussed was the desirability of taking steps to seek a distribution of the gold the United States and other member countries subscribed to the International Monetary Fund (IMF). The United States would be entitled to buy 23.6 million ounces of gold from the IMF at SDR 35, or \$40.86 per

ounce, if by an 85% vote of the IMF Executive Board a decision were taken to sell gold for currency to members of the IMF or to others.

The argument for such a sale of IMF gold to its members is that currently gold has no central role in the international monetary system and no longer serves as the common denominator of a par value system or as the unit of value of the SDR; its official price has been abolished; members of the IMF have no obligation to use gold in transactions with the IMF; and the IMF is prohibited from accepting gold unless approved by an 85% vote of its members. The 1976-80 program of IMF gold sales also attests to the intention to demonetize gold.

The argument against seeking such gold sales by the IMF is essentially the same one that underlies the belief that the United States should retain significant gold holdings. If gold is an important strategic and monetary resource for the United States, it should also be so regarded by the international community, and retained by the IMF for possible use in various contingencies.

Majority Recommendation 1. We favor no change in a flexible exchange rate system because in a world with varying inflation rates in most countries, maintaining permanently fixed rates is not possible.

Minority Recommendation 1. We support fixed exchange rates for the U.S. dollar to be introduced at the earliest possible date.

Majority Recommendation 2. We oppose action by the United States to seek a distribution of IMF gold to member countries.

Minority Recommendation 2. We support taking steps to seek a distribution of IMF gold to member countries. One of us believes the recommendation should be considered, with the proceeds to be distributed partly to less developed countries. Another one of us would use the proceeds for coinage by the U.S. Treasury.

Conclusion

In presenting our report, we are conscious of the complexity of an attempt to define what the role of gold should be in the domestic and international monetary systems.

The majority of us at this time favor essentially no change in the present role of gold. Yet we are not prepared to rule out a role for gold at some future date. If we fail to restore price stability in the years ahead, we believe that those who advocate an immediate return to gold will grow in numbers and influence. If we do succeed in restoring price stability, tighter linkage of our monetary system to gold may well become unnecessary.

The minority of us who regard gold as the only real money the world has ever known have placed our views on record. The only way price stability can be restored here (indeed, in the world) is by making the dollar (and other national currencies) convertible into gold. Linking money to gold domestically and internationally will solve the problem of inflation, high interest rates, and budget deficits.

We have made no attempt to dissemble the divisions among us.

In that respect, our views probably represent the range of opinions held by the country at large. We hope, nevertheless, that our report will make a contribution to public understanding of the important issues involved. In that event, the time we have devoted to preparatory study before our meetings and to the deliberations themselves will have been well spent.

Chapter 1

Background to the Establishment of the Gold Commission

The focus of this chapter is the period before October 1980 when the provision to create the Gold Commission was enacted. That provision was a product of growing concern in many quarters in this country over the persistence and acceleration of inflation here since 1964. Many citizens believe that an expanded and more explicit role restored to gold in the U.S. monetary system is the solution to the problem of inflation, arguing that it will both promote monetary and fiscal discipline and reduce inflationary expectations.

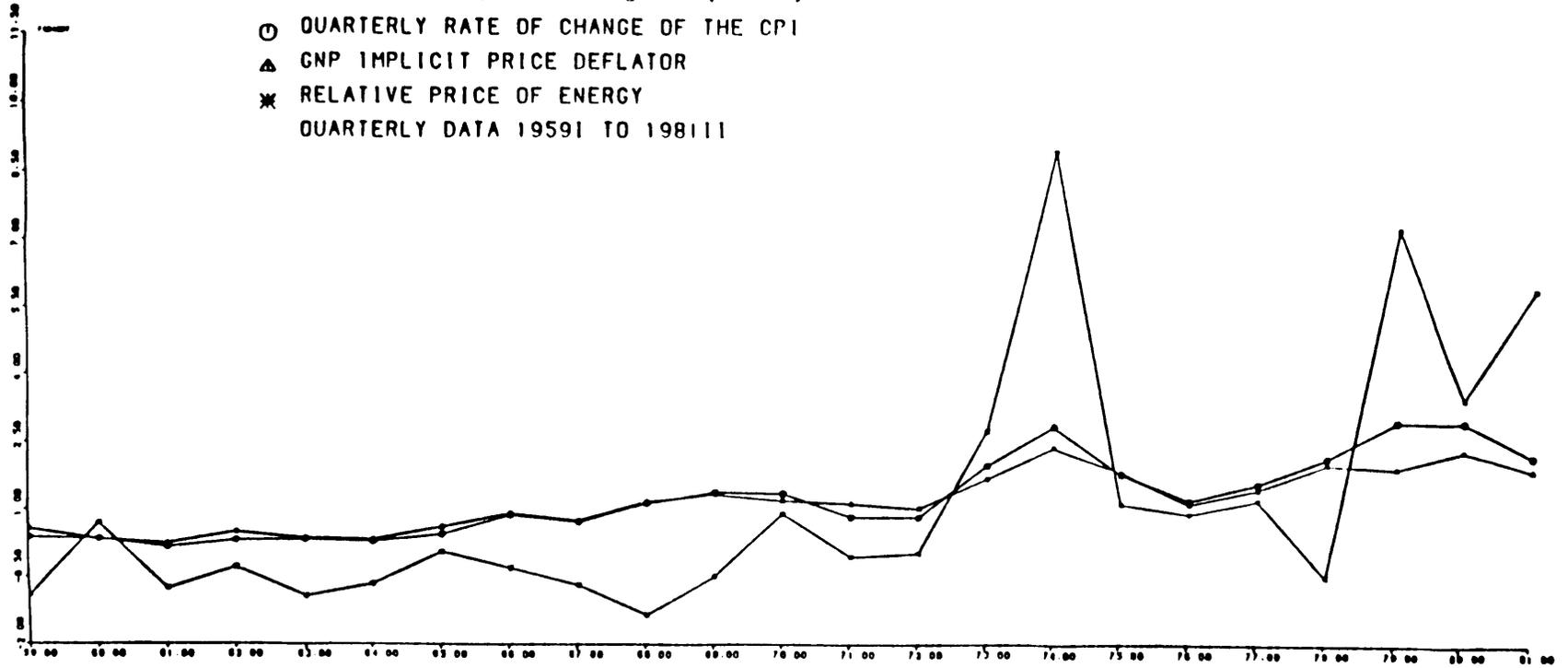
The Record of Inflation

Inflation may be defined as a sustained rise in the price level.¹ It can be observed in the pattern of behavior of both the price deflator implicit in GNP and the consumer price index presented in Figure 1-1. The rate of increase in the deflator rose from less than 1 per cent per year in 1961 to 9 per cent in 1980, while the rate of increase in the consumer price index rose from 1 per cent to 11 per cent in the same period. We report the movements of the consumer price index since they are the measure of inflation with which the public is most familiar. However, there are well-known biases in this measure, particularly, the effect of housing mortgage costs, that may overstate the degree of inflation in the economy.² The rate of price increase was not steady but ratcheted upwards with fluctuations in economic acti-

Figure 1-1

TWO MEASURES OF INFLATION AND THE RELATIVE PRICE OF ENERGY, 1959 - 1981
(Annual averages of quarterly data)

- ⊙ QUARTERLY RATE OF CHANGE OF THE CPI
 - △ GNP IMPLICIT PRICE DEFLATOR
 - * RELATIVE PRICE OF ENERGY
- QUARTERLY DATA 1959I TO 1981I



vity.

Economists are divided on the root causes of inflation. Some attribute it to excessive wage demands fostered by aggressive unions, profit-push pricing by monopolistic firms, random factors like poor agricultural harvests, and institutional and sociological patterns, each of greater or lesser importance in specific inflationary episodes. Other economists regard inflation as primarily a monetary phenomenon, explained by monetary growth in excess of the long-run trend of real output growth. They recognize, however, that other factors may temporarily affect the inflation rate independent of the rate of monetary growth. No one has stated these propositions more lucidly than Chairman Paul A. Volcker of the Board of Governors of the Federal Reserve System who observed on February 1, 1980:³

"Our policy, viewed in a long-term perspective, rests on a very simple premise -- that the inflationary process is ultimately related to excessive growth in money and credit. This relationship is of course a complex one, and there are many facets of it that are sensitive to nonmonetary economic variables. But, in spite of all the nuances, it is clear that inflation cannot persist over the long run in the absence of excessive monetary growth."

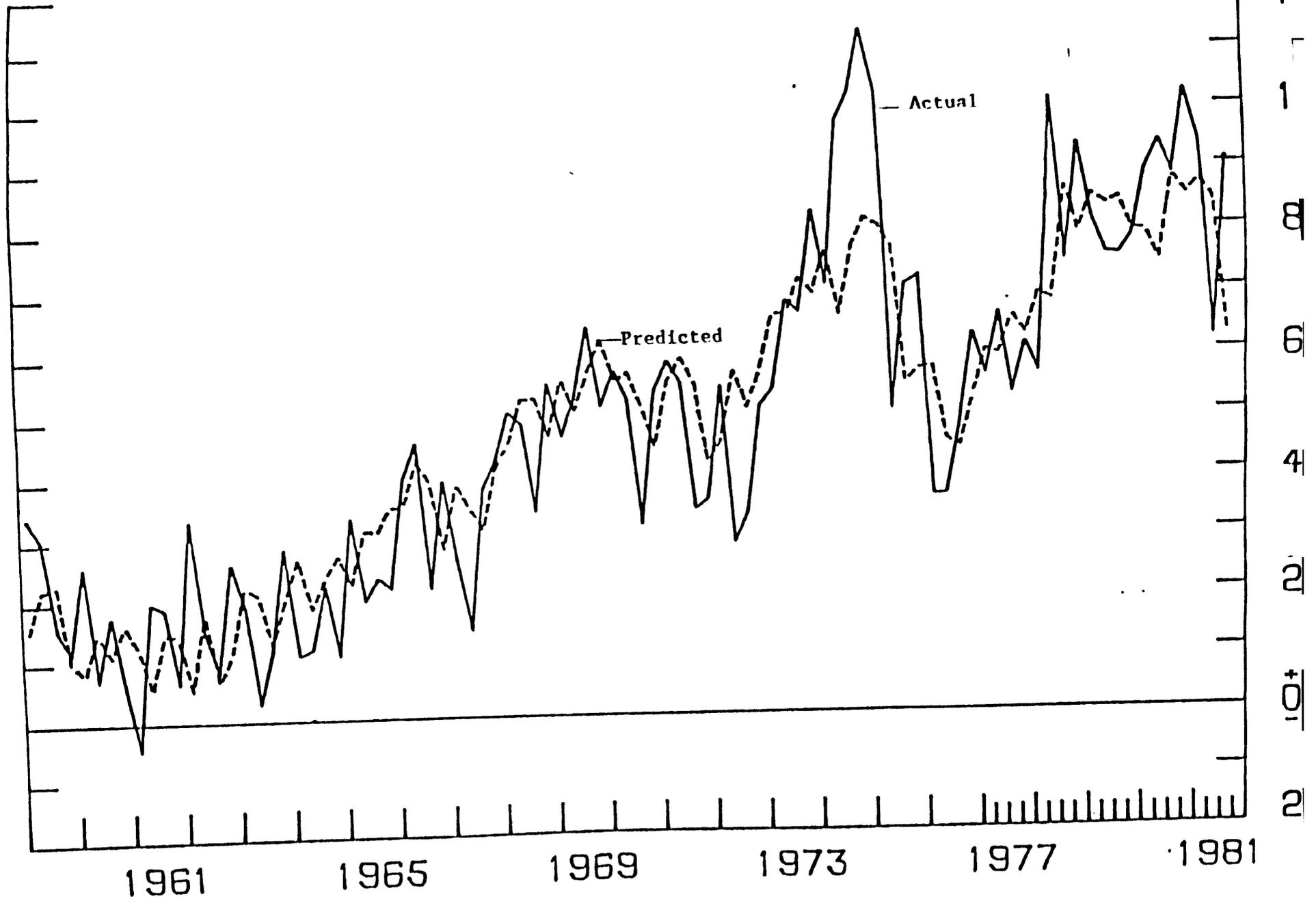
It is not our purpose here to settle the long-standing division among economists on the causes of inflation. Our purpose is

simply to present some pertinent background information on the state of the U.S. economy in the decade and a half preceding October 7, 1980.

On Figure 1-2, the quarterly rate of inflation at annual rates, calculated from the index numbers for the deflator, are plotted together with the trend rate of inflation generated by a twelve-quarter moving average of lagged monetary growth.⁴ A fairly close link between the two series may be observed, with the major exceptions of the years 1974-1975 and 1979-1980.⁵ Both of these episodes can be explained by the large rise in the real price of energy, defined as the annual rate of change of the producer price index of fuels and related products and power minus the GNP price deflator (see Figure 1-1). Though the inflation since the 1960s may be regarded as primarily a monetary phenomenon, it is still essential to account for the factors that produced excessive monetary growth as well as other independent sources of inflation.

Table 1-1 presents, on an annual basis, as well as for six subperiods a number of relevant measures of economic performance crucial to an understanding of the development of U.S. inflation from 1960 to 1980. Columns 1-5 give the annual (and subperiod average) rates of growth of the money stock, defined as M1B, real GNP, the GNP price deflator, the CPI, and the real price of energy. Columns 6-11 give the annual (and subperiod average) unemployment rate, the Federal budget deficit as a ratio to GNP,

ACTUAL AND PREDICTED INFLATION,¹ 1959-1981
(Quarterly data using GNP deflator and observed M1-B)



¹ with first-order error autocorrelation correction.

Table 1-1

Selected Economic Indicators, Annually, and by Subperiods, 1960-1980

Calendar Year	Annual Rate of Change (in percent)					Unemployment Rate (6)	Ratio of Federal Budget Surplus (Deficit) to GNP (7)	Ratio of Total Funds Raised by U.S. Federal Government to Total Nonfinancial Sector Funds (8)	Balance ^c of Payments Deficit(-) Surplus(+) (\$ millions) (9)	U.S. Monetary Gold Stock ^d (\$ millions) (10)	Trade-Weighted Exchange Rate of the dollar (1972-100) (11)
	MIB (1)	Real Output (1972-100) (2)	Implicit Price Deflator (1972-100) (3)	CPI (1967-100) ^a (4)	Real Price of Energy (1972-100) (5)						
1960	0.6	2.2	1.6	1.6	-0.7	5.5	0.6	n.a.	672	17,804	
1961	3.1	2.6	0.9	1.0	0.2	6.7	(-0.7)	15.4	-158	16,947	
1962	1.8	5.8	1.8	1.1	-2.2	5.5	(-0.9)	12.9	265	16,057	
1963	3.6	4.0	1.5	1.2	2.1	5.7	0.1	6.9	-1,608	15,596	
1964	4.5	5.3	1.5	1.3	-4.4	5.2	(-0.5)	9.2	-1,489	15,471	
1960-64	2.8	4.3	1.4	1.2	-2.1	5.7	-0.2	11.1	-464	16,231	
1965	4.5	6.0	2.2	1.7	-0.4	4.5	0.1	2.6	1,091	13,806	
1966	2.4	6.0	3.2	2.9	-0.8	3.8	(-0.2)	5.2	1,242	13,235	
1967	6.3	2.7	3.3	2.9	-0.7	3.8	(-1.7)	15.6	-5,874	12,065	119.96
1968	7.5	4.6	4.4	4.2	-5.6	3.6	(-0.7)	13.7	-3,048	10,892	122.06
1969	3.1	2.8	5.1	5.4	-3.0	3.5	0.9	-3.9	-2,480	11,859	122.39
1970	5.1	-0.2	5.4	5.9	-0.1	4.9	(-1.2)	12.6	-3,560	11,070	121.07
1965-70	4.9	3.1	4.1	4.2	-2.0	4.0	-0.5	7.6	-2,105	12,155	121.37
1971	6.3	3.4	5.0	4.3	3.2	5.9	(-2.0)	16.3	-23,813	10,206	117.81
1972	8.8	5.7	4.2	3.3	-1.1	5.6	(-1.4)	8.5	-9,769	10,487 ^f	109.07
1973	5.4	5.8	5.7	6.2	7.0	4.9	(-0.4)	4.1	-5,868	11,652 ^R	99.14
1971-73	7.0	5.6	4.8	4.6	2.8	5.5	-1.3	9.6	-13,150	10,782	108.67
1974	4.2	-0.6	8.7	11.0	41.4	5.6	(-0.8)	6.2	-12,013	11,652	101.42
1975	4.7	-1.1	9.3	9.1	7.4	8.5	(-4.5)	40.5	-7,876	11,599	98.50
1974-75	4.5	-1.1	8.9	8.8	7.1	7.1	-2.7	23.4	-9,945	11,626	99.96
1976	6.3	5.4	5.2	5.8	3.0	7.7	(-3.1)	25.4	-20,251	11,598	105.63
1977	7.8	5.5	5.8	6.5	7.5	7.0	(-2.4)	16.8	-36,950	11,719	103.35
1978	7.9	4.8	7.3	7.7	0.7	6.0	(-1.4)	13.4	-34,025	11,671	92.39
1976-78	7.6	5.0	6.4	6.8	4.0	6.9	-2.3	18.5	-30,409	11,663	100.46
1979	7.1	3.2	8.5	11.3	16.7	5.8	(-0.6)	9.5	16,543	11,172	88.07
1980	6.2	-0.2	9.0	13.5	29.1	7.1	(-2.4)	21.6 ^b	-6,872	11,160	87.39
1979-80	6.2	-0.2	8.6	12.6	25.5	6.5	-1.5	15.6	4,876	11,168	87.71

Notes to Table 1-1

- a Year-to-year percent change.
- b Average of first three quarters seasonally adjusted data.
- c U.S. net official reserve assets minus net foreign official assets plus allocations of SDRs.
- d See note a to Table 2-1 below.
- e See note b to Table 2-1 below.
- f See note d to Table 2-1 below.
- g See note e to Table 2-1 below.

Source by Column

- 1-4, 6-9: Economic Report of the President, January 1981, Tables B-59, B-3, B-31, B-74 as ratio of B-1, B-62, B-99.
For Col. 8, before 1972, Economic Report, January 1979 Table B-62; February 1970, Table C-52.
For cols. 2 and 9, full year data for 1980, from Survey of Current Business, March 1981, pp. S-6 and 50, lines 38 and 57.
- 5: Federal Reserve Bank of St. Louis data Bank.
- 10: Table 2-1 below.
- 11: Federal Reserve Bulletin 64 (August 1978): 200; 67 (October 1981): A-68.

the ratio of funds raised by the U.S. Government to total funds raised by the non-financial sector, the balance of payments surplus (deficit) on an official settlements basis, the dollar value of the U.S. monetary gold stock, and the trade-weighted dollar exchange rate (beginning 1967).⁶

We begin by describing briefly six subperiods of the past two decades before turning to a more detailed examination of the salient factors that account for the persistence of inflation, despite recurrent attempts to curb it.

1. 1960-1964. This period of stability, which actually began in 1958, was characterized by low monetary growth and, by historical standards, a low rate of inflation. Productivity growth was favorable and significant external shocks were absent. These years serve as a benchmark for the succeeding periods.

2. 1965-1970. The onset of steadily rising inflation in this period is generally associated with the financing of the Vietnam war and expanded Federal social programs. Both a rise in the rate of monetary growth and in fiscal deficits may be observed in columns 1 and 7. During the period 1965-1970, both monetary and fiscal policy were generally expansionary despite two significant attempts to reverse the inflationary process. Monetary growth was markedly reduced in 1966 in an episode commonly designated as "the credit crunch," and in 1969, a decrease in monetary growth supplemented a 1968 tax increase. The monetary gold stock declined in every year since 1960 except 1968-69, the declines

reflecting the role of the United States as the world's central banker and the more rapid rise in U.S. inflation than elsewhere.

3. 1971-1973. In the belief that the inflation rate was slow in falling in response to the recession in business activity in 1970 and as a way of staunching the growing balance of payments deficits, the Nixon Administration sought a quick solution by resorting to direct controls on prices and wages in August 1971. The policy was in effect for the next three years. Initially, wages and prices were frozen for ninety days. Subsequently, mandatory wage and price guidelines were imposed that were gradually relaxed.

The measured inflation rate declined in 1971 and 1972, and there was satisfaction with the reduction in the inflation numbers. Yet, in retrospect, monetary growth was overexpansionary during these years and the first half of 1973. Consequently when the controls were eased in 1973, the pent-up excess demand quickly restored the inflation rate to its underlying trend rate.⁷ To halt further depletion of its monetary gold stock, the United States closed the gold window in August 1971, and in 1973 abandoned the attempt to maintain fixed foreign exchange rates for the dollar.

4. 1974-1975. These unusual years were dominated by two sets of forces: contractionary money growth and an extraordinary rise in the real price of energy following the Arab oil embargo of 1973 (see Figure 1-1 and Table 1-1, col. 5). Some regard the energy

price rise as retribution for the inflation the United States exported to the rest of the world in the 1960s.

The supply shock raised the inflation rate well above the trend rate for the two years, substantially reduced real output growth, and raised the unemployment rate (Table 1-1, cols. 3 and 6).

5. 1976-1978. As a consequence of the 1974-75 recession, the unemployment rate rose to a level unprecedented in the post-World War II period. In reaction, the money growth rate was accelerated, and fiscal policy became generally expansionary. Once the effects of both the removal of price controls and the external energy supply shock had worked their way through economic processes, the inflation rate fell to its trend rate in 1976. In 1977 and 1978 the inflation rate moved up again.

6. 1979-1980. A further assault on the inflation problem in 1979 by means of monetary and fiscal restraint was thwarted by a second rise in the real price of energy. But in the face of overall monetary restraint in 1980, the effect of the energy price rise on the rate of inflation proved to be temporary.

Why the Setbacks to Success of Anti-Inflation Policies?

We now examine some of the reasons that explain the lack of success that has attended efforts since the mid-1960s to achieve a permanent reduction in the inflation rate.

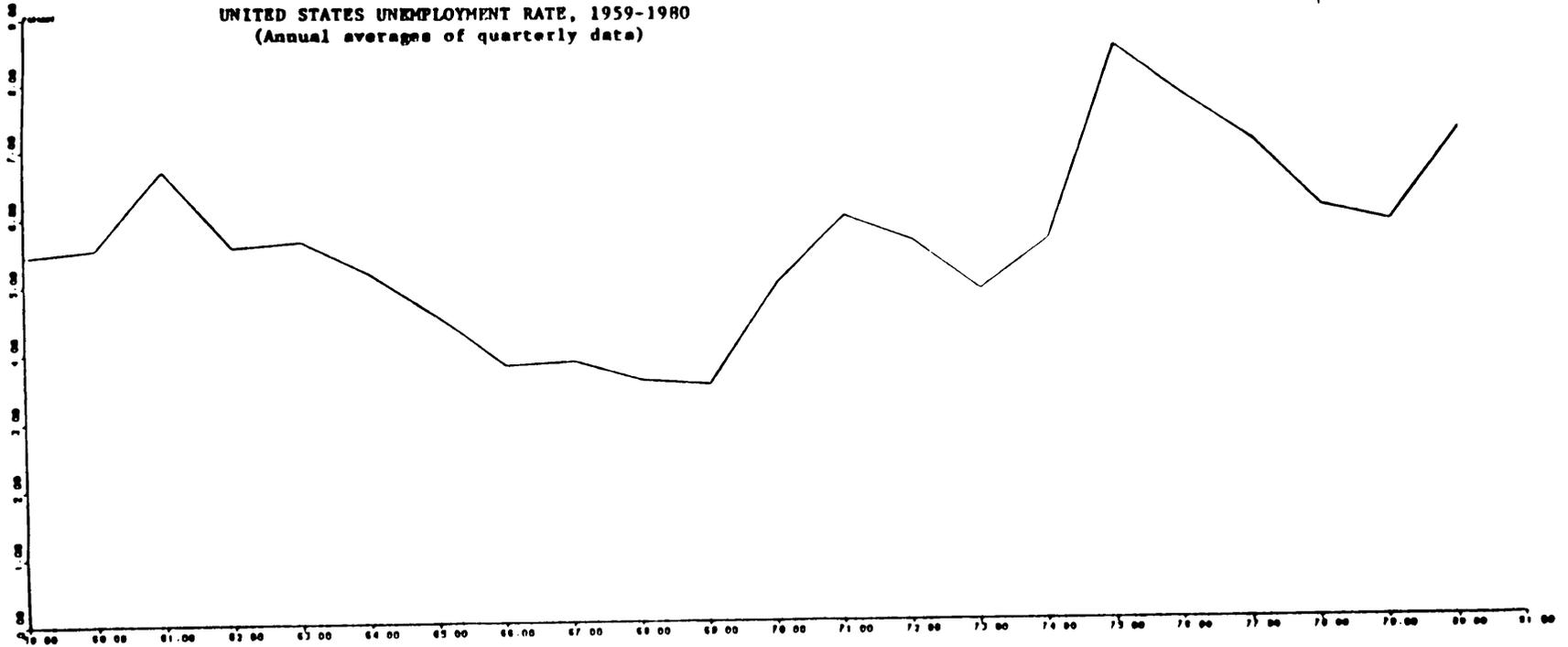
1. The Inflation-Unemployment Tradeoff. Hidden within the brief sketch of the events of the past two decades is a dilemma in the

implementation of anti-inflation policies -- the so-called trade-off between inflation and unemployment. Empirical evidence lends support to the view that both monetary and fiscal policy have a lagged effect on economic activity measured in current prices. The initial effect of contractionary monetary and fiscal policy is on the level of real output and the unemployment rate (within one to three quarters after the policy is in place). The initial effect is temporary. It is attributable to the lag in the adjustment of wage and price expectations and the inflexibility of contracts. The ultimate effect of contractionary monetary policy is on the price level and the rate of inflation. The time that elapses before the inflation rate is reduced, however, is measured in several years, not in several quarters.

Accordingly, attempts to reduce inflation by monetary means have quickly led to reduced real output growth and increased unemployment. These results have occasioned a reversal of the contractionary policy before it could succeed in significantly reducing the inflation rate. The pattern is observable following the reduction in monetary growth in 1969, which initially led to the recession in real output and rise in unemployment in 1970 (Figures 1-2 and 1-3). The contractionary policy was then reversed. A similar sequence occurred in 1974-1975, when contractionary monetary policy from mid-1973 and 1974 led in 1974-1975 to a dramatic decline in real output and a rise in unemployment, partly associated with the unexpected energy supply

FIGURE 1-3

UNITED STATES UNEMPLOYMENT RATE, 1959-1980
(Annual averages of quarterly data)



shock. The sequel for the next three years was an increase in monetary growth to levels not reached since 1973.

The evidence thus suggests that a policy of noninflationary monetary growth before 1980 was never maintained long enough to reap the benefits of the policy. The distinction between the short-run undesirable effects of such a policy and the long-run desirable effects has apparently not been understood by the public or political leaders. The negative effects on output and employment of monetary restraint have been perceived as likely to last forever, with no recognition that the benefits of reduced inflation will then emerge and have a positive effect on output and employment.

It is not surprising or irrational for the public to view the cost of a policy of monetary restraint as high and unrelenting and the benefits dubious. In the decade and a half before 1980, they experienced the costs and hardly any benefits of decelerating money growth. The experience in some other countries is different and the public perception of the effects of noninflationary monetary policy is correspondingly different.

There is also no widespread public understanding of the inflationary long-run effects of rapid money growth. The public and many political leaders also fail to recognize the distortions and disincentives caused over the long run by persistent accelerating inflation. These produce long-run effects on output and employment that are largely unrecognized by the public.

Thus the policy of "buying" more output and employment growth is tempting and politically appealing, for the benefits are immediate and the costs are postponed and unrecognized. A policy of decelerating money growth is not appealing, for the costs are immediate and the benefits are delayed and not recognized by most of the public.

Finally, we note that the lag in the response of inflation to decelerating money growth seems to be getting shorter. The reaction time of export, import, and commodity prices has speeded up since market participants have begun to pay attention to the monetary growth rate and since the floating of the dollar foreign exchange rates.

2. Sectoral Effects. The impact of anti-inflation actions falls disproportionately on certain sectors. Reduced provision of reserves to the banking system restricts the volume of loans to small business and the accompanying increase in interest rates restricts housing dependent on mortgage funds. Interest rates rise immediately when money growth decelerates but it takes time until the subsequent decline in inflation leads to a fall in interest rates. If the response is expansion of Federal programs to alleviate the distress of small business and the mortgage market, anti-inflation actions may be nullified.

Inflation, when not fully anticipated, has significant distribution effects. Generally, debtors gain at the expense of creditors, as do those with incomes indexed to inflation relative

to those on fixed incomes. Home-owners in particular have been beneficiaries of inflation.

3. Inflationary Expectations. Inflationary expectations on the part of the private sector have been reinforced by the evidence of the past 15 years that inflation has only been temporarily reduced in response to contractionary policy. Hence, when a new round of contraction in monetary growth gets under way, the public may regard the new round as only temporary, as in past episodes, and not reduce their expectations of further inflation. The resistance of expectations to modification prolongs actual inflation by affecting wage demands and pricing decisions and maintaining upward pressure on interest rates.

Inflation expectations are believed to be incorporated rapidly and completely in asset prices that are determined in auction markets. A comparison of Figures 1-1 and 1-4 reveals that movements in a long-term interest rate (the yield on AAA corporate bonds) over the whole period are closely associated with the trend rate of inflation. Short-term interest rates (such as the 90-day Treasury bill rate) are more volatile, reflecting both a negative response to short-term changes in monetary growth and a positive response to expected inflation. Since the freeing of the gold market in 1968, the price of gold has also served as a good barometer of market anticipations of inflation. As can be seen in Figure 1-5, its movements are volatile but closely related to both world and domestic inflation

FIGURE 1-4

YIELDS ON SHORT- AND LONG-TERM SECURITIES,
1959-1981
(Annual averages of quarterly data)

- U.S. GOVERNMENT SECURITY YIELD: 3 MONTH BILL YIELD
- × BOND YIELD: MOODY'S AAA CORPORATE YIELD
(QUARTERLY DATA 1959:1 TO 1982:1)

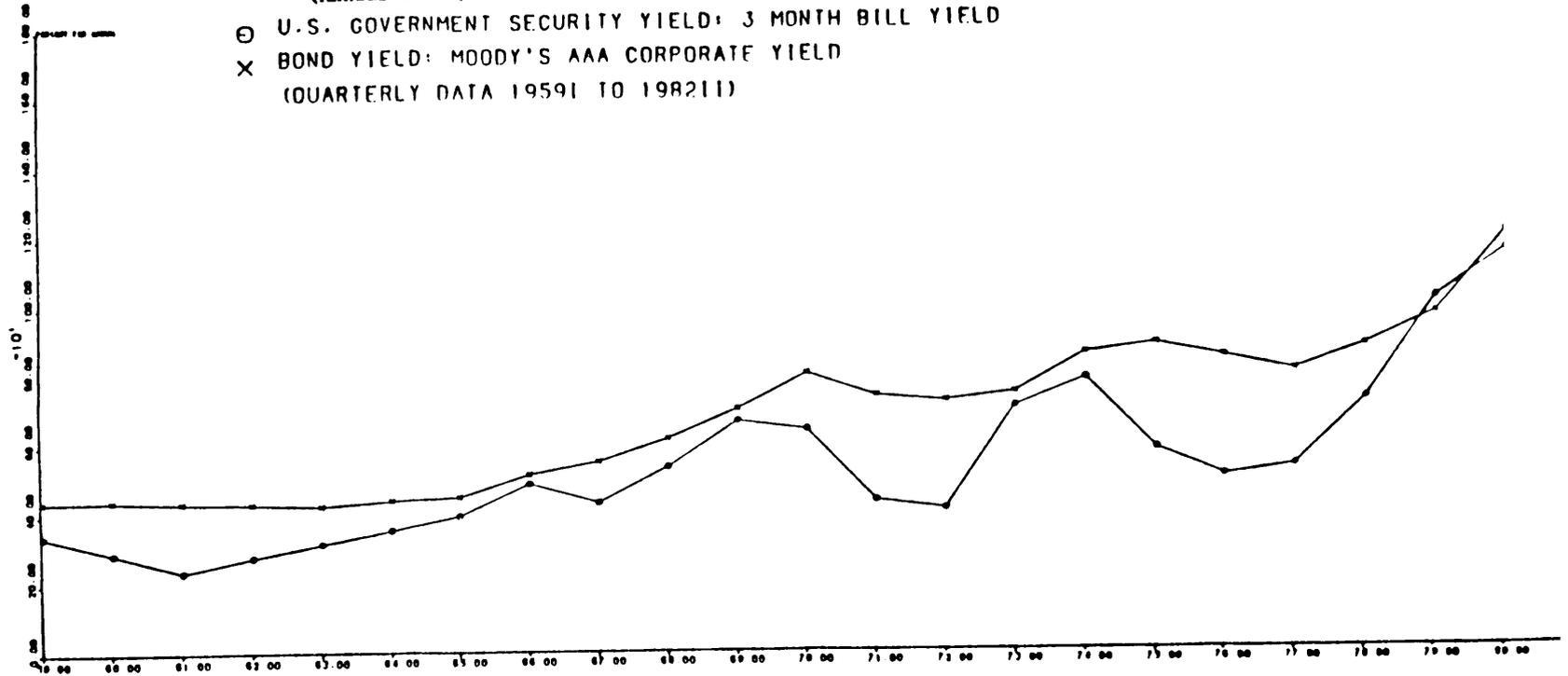
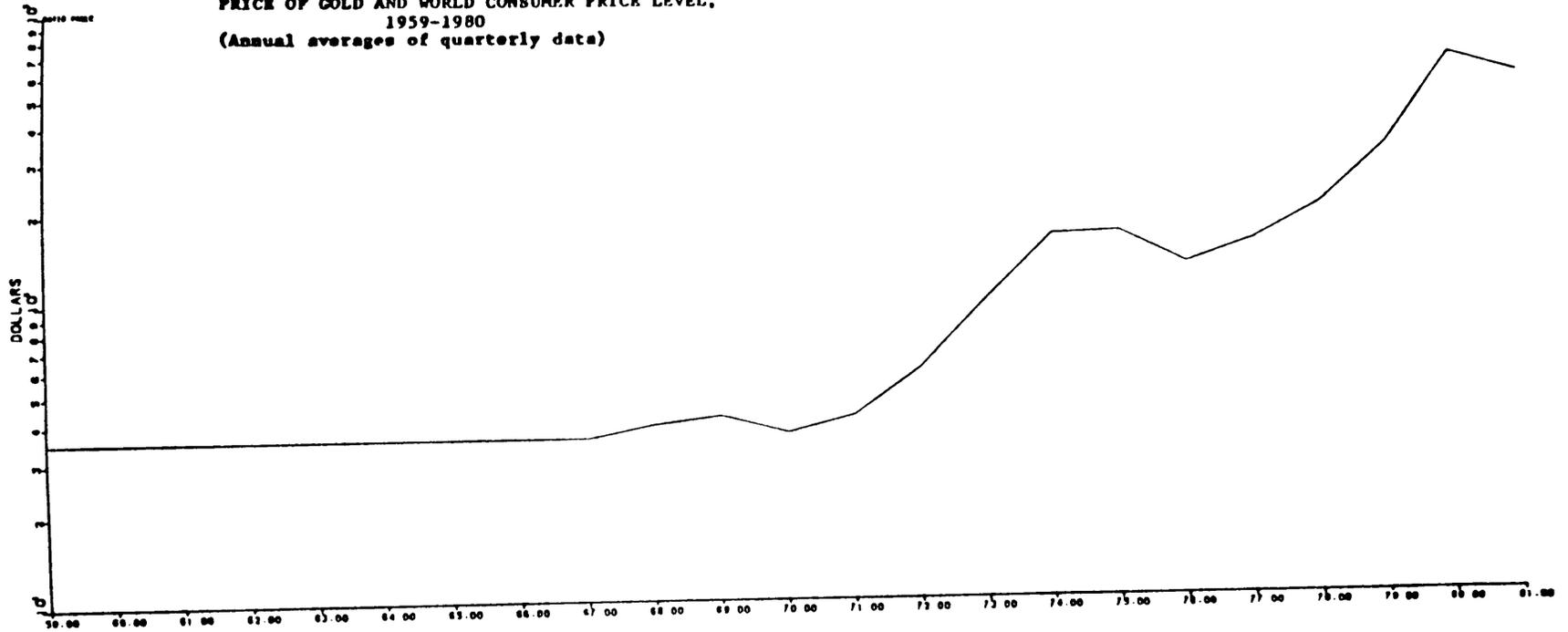


FIGURE 1-5
PRICE OF GOLD AND WORLD CONSUMER PRICE LEVEL,
1959-1980
(Annual averages of quarterly data)



**NOTE: Figure including the world consumer price level
will shortly be available for distribution.**

CALIFORNIA COMPUTER PRODUCTS, INC. ANAHEIM, CALIFORNIA CHART NO. 600

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rates.

To the extent that expectations of inflation are embedded in long-term contracts, both explicitly and implicitly, in labor and product markets, an attempt to reduce inflation by contractionary monetary growth must impose real hardship, at least until contracts can be adjusted. Yet the extent to which contracts will be renegotiated depends on whether the parties expect the policy to be enduring or quickly reversed.

4. Structural Changes. A number of structural changes in the economy, independent of, or interacting with, the rate of monetary growth contributed to the difficulty of achieving positive results with anti-inflation actions. Four such changes are discussed: (a) Declining productivity growth; (b) Rising velocity; (c) Persistent Federal budget deficits; (d) Foreign influences on the open economy.

(a) Declining productivity growth. Growth in output per manhour has declined in the United States (as it has in most industrialized economies) since the mid-1960s. Since reduced productivity growth implies a lower trend real growth rate, a given rate of monetary growth will be associated with a higher rate of inflation.

(b) Rising velocity. The trend in income velocity of circulation of M1B (the ratio of GNP to the most widely used monetary aggregate) has been rising on average at slightly over 3 per cent per year since the late 1950s. The trend reflects the process of

financial innovation, that is, the substitution of new types of payments media for currency and deposits. Because of this development, a given rate of monetary growth will be associated, other things equal, with a more rapid rate of inflation.

Inflationary expectations will be incorporated in market interest rates and hence will tend to raise velocity. Although this phenomenon figures significantly during hyperinflations, the evidence does not suggest that expectations have been a significant factor affecting velocity during the past two decades.

(c) Persistent Federal budget deficits. Budget deficits hamper anti-inflation policies in two ways. They may indirectly cause an increase in monetary growth when the authorities offset the high interest rates associated with bond financing of the deficit. Alternatively, budget deficits may increase velocity when the deficit is financed by the sale of government securities, in competition with private borrowers for private sources of funds. The rise in market interest rates leads to a rise in velocity and, for a given rate of monetary growth, a higher inflation rate.

Both effects have undoubtedly been present in U.S. history. A controversy exists in the literature on the relation between budget deficits and monetary growth.⁸ One channel emphasized in papers supporting such a link is the response of the Federal Reserve to increases in interest rates associated with deficits. Under Federal Reserve procedures before October 1979, the

Federal Reserve would increase monetary growth when interest rates rose. Table 1-1 shows that the ratio of the Federal budget deficit to GNP is not closely correlated with either monetary growth or inflation on an annual basis. However, the subperiod averages do show a correlation between deficits, monetary growth and inflation. In addition, the evidence for other countries does not support such a link. On the other hand, full employment deficits rather than actual budget deficits have been found to be closely linked to U.S. monetary growth.⁹ Higher government spending by itself, without regard to its effect on budget deficits, has also been linked to monetary growth.¹⁰

The connection between bond-financed deficits, rising velocity, and inflation is also not empirically established. Since the mid-1950s years of rapid inflation are not generally years when financing the Federal budget pre-empted a large share of total financial funds.¹¹ The subperiod averages also show the same result.

d. Foreign influences on the open economy. Under the Bretton Woods system, deficits in the U.S. balance of payments increased in the 1960s. Initially, the deficits were regarded as satisfying a rising world demand for international reserves, since the dollar served as the world's principal reserve asset. As the deficits persisted, they were regarded less benignly as a reflection of excess monetary growth. Because the dollar served as the principal reserve asset in the post-World War II period,

there was less pressure on the United States by her trading partners than might otherwise have been the case to respond to the persistent balance of payments deficits by monetary and fiscal restraint. Moreover, the deficits served to increase world liquidity and so transmit inflationary pressures on other countries that either voluntarily or involuntarily fell in step with U.S. inflation rates.

The decline in the U.S. monetary gold stock and in the gold reserve ratio against Federal Reserve notes by the later 1960s heightened concern abroad that convertibility of the dollar into gold was threatened, concern that culminated in runs on the dollar in 1967 and 1968, the establishment of the two-tier gold market in 1968, and the abandonment in August 1971 of the U.S. commitment to convert dollars held by official agencies into gold.

Thus rather than acting as a constraint on domestic inflation, the Bretton Woods fixed-exchange rate system did not do so and also served to transmit U.S. inflation abroad. Finally, when convertibility domestically and internationally conflicted with overall domestic policy goals, it was abandoned.

In 1971 and 1973, the dollar was devalued, and since then, the exchange rate of the dollar has floated. Under a floating exchange rate system, the international economy provides even less of a constraint on domestic and monetary fiscal policy. If a country has a more rapid inflation rate than the rest of the

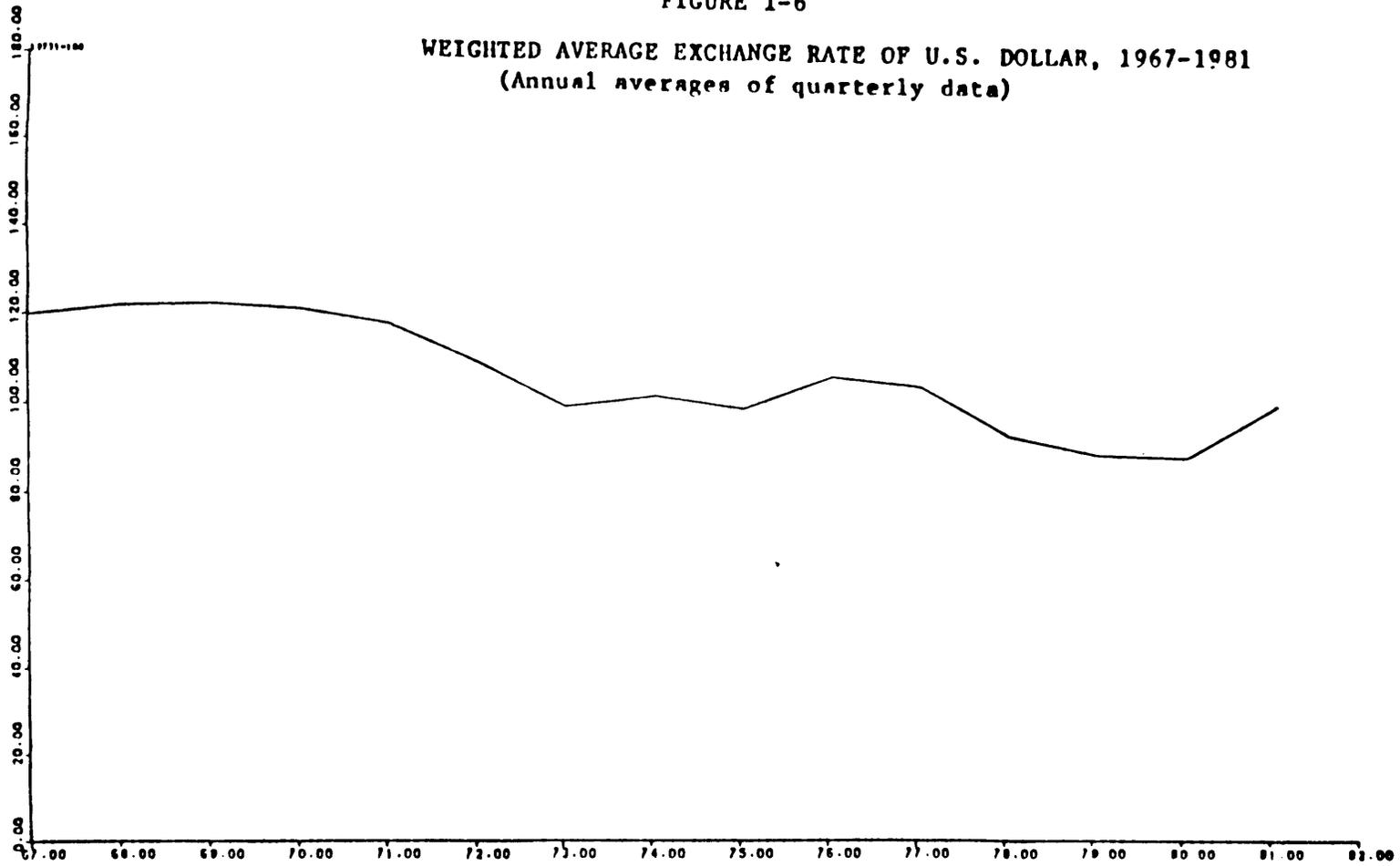
world, then the exchange rate, which can be viewed as a measure of the purchasing power of its money relative to that of other countries, will steadily depreciate. The U.S. dollar exchange rate has depreciated over the whole period since 1971 but the decline has been interrupted by several significant upswings (Figure 1-6 and Table 1-1, col. 11).

Theoretical arguments have been made that under floating exchange rates foreign influences can still have effects on domestic prices and activity, independent of domestic policy. One view is that the world is characterized by high capital mobility, and a rise in interest rates in one center is rapidly transmitted to another so that velocity behavior is similar internationally. If high capital mobility were a fact, then assets denominated in different currencies would be perfect substitutes. This conclusion breaks down if assets, that is, securities, are not perfect substitutes internationally because of risk with respect to exchange rate changes or to capital controls. With imperfect asset substitutability, there may be movements in relative national interest rates insulated from the rest of the world.

Another view is that independent monetary policy cannot succeed under floating exchange rates because of currency substitution, that is, an effort to restrict monetary growth domestically will be frustrated by the substitution of currencies issued by other countries. The argument is that the effect of reducing

FIGURE 1-6

WEIGHTED AVERAGE EXCHANGE RATE OF U.S. DOLLAR, 1967-1981
(Annual averages of quarterly data)



NOTE: To be replotted on a narrower scale.

the growth rate of the domestic money stock is to impose a tax on domestic money holders, causing them to switch into holding foreign monetary assets including Eurodollars. Two problems undermine the argument. One is conceptual. The community is concerned with the real value of its money holdings -- what these will buy -- and receives a flow of real services from its real money balances. Thus a policy which reduces the rate of growth of the nominal money stock and the price level reduces the inflation tax on domestic real balances, and promotes holding larger real money balances. The second problem is empirical, whether the existence of foreign currency deposits as a possible substitute has had a significant impact on the demand for domestic real money balances. While theoretically possible, empirical evidence in support of the view is mixed at best.¹²

Just as a floating exchange rate makes possible monetary independence, it can also insulate a country from external real shocks. Floating exchange rates cushioned the U.S. economy against the effects of the rise in oil prices in 1979-1980. The decline of 10 per cent in the exchange rate from 1972 to 1973-1975 (bridging the devaluation of the dollar and the start of flexibility) and again in 1979-1980 was a source of insulation, since the extent of the decline was greater than would be explained by the trend rate of inflation. Nevertheless, the foreign oil shock did temporarily raise the domestic inflation rate. It did so through two channels. First, to the extent that

the rise in imported oil prices was not fully absorbed by the exchange rate, it had a direct effect on the domestic price level. Second, a depreciating exchange rate itself tends to raise the domestic price level by raising the price of imports in general. The effects on the inflation rate are temporary until expenditure and production are directed away from the more expensive oil-intensive sectors of the economy.

5. Incomes Policies. Some observers believe that the reason anti-inflation policies have not succeeded is that the demand restraint by itself is too costly to pursue. They argue that incomes policies that attempt to influence the setting of wages and prices directly will decrease inflation and increase the growth of output and employment that result from any given degree of demand restraint. One such policy that has some support would use the tax system to provide incentives to firms and workers to slow the rate of inflation. Different versions of tax-based incomes policy (TIP) exist. It is acknowledged that a TIP cannot substitute for demand restraint. The policy can only supplement it.

Conclusion

The basic economic problem that has plagued the United States (and the rest of the world) since the mid-1960s has been the persistence and acceleration of inflation, with its associated economic distortions, disincentives and risks. We have reviewed the difficulties encountered by the U.S. monetary and fiscal author-

ities over this period in their successive attempts to pursue anti-inflation policies. The provision to create of the Gold Commission was an expression of dissatisfaction with the unsuccessful outcome of these past attempts.

To determine if greater success is possible in the future, it is important to advance proposals that can cope with the difficulties that have attended policymakers' past efforts in dealing with the problem of inflation. Our mandate is to conduct a study to assess the role of gold. To do so, we examine the historical record of U.S. experience with gold (Chapter 2), discuss different forms of the gold standard and alternative monetary standards (Chapter 3), and describe a host of proposals, some involving a role for gold, some not, that have been submitted to us as the means for achieving price stability (Chapter 4).

The test of the usefulness of these proposals is the extent to which they are immune to the kinds of pressures, noted in this chapter, that have prevented the achievement of a stable price level.

Notes to Chapter 1

1. The definition of inflation as a sustained rise in the price level has no implication as to its cause. It merely states that a rise in the price level that lasted for one day, one month, one quarter, or one year would not qualify as an inflation. A rise over a period of years would.

Sympathizers with the views of the "Austrian" branch of economics are opposed to the use of the concept of "the price level." They hold that it is virtually impossible to construct a price index that accurately reflects changes in the value of money. They see the difficulty as heightened during an inflationary environment when relative prices change more than they otherwise would and a price index fails to capture these effects. Instead, this group defines inflation as a rise in the supply of money. See the writings of such Austrians as Ludwig Von Mises, The Theory of Money and Credit, London: Jonathan Cape, 1952 (reprinted by the Foundation for Economic Education, 1971); and Murray Rothbard, Man, Economy and State, Los Angeles: Nash Publishing, 1962.

2. On the limitations and deficiencies of the consumer price index and feasible improvements in it, see Phillip Cagan and Geoffrey H. Moore, The Consumer Price Index, American Enterprise Institute Studies in Economic Policy, 1981.
3. Statement before the Joint Economic Committee of the U.S.

Congress, in Federal Reserve Bulletin, February 1980, pp. 137-43 (quotation on p. 140).

4. The formula for the technique used is

$$\hat{p}_t = a + \sum_{i=1}^{12} b_i m_{t-i} + e_t$$

Where \hat{p} , m , refer to the quarterly change in the logarithms. We adopted a 12-quarter lag because it produced the lowest standard error of estimate (a measure of the dispersion of the error term associated with the regression line) of successive lags, ranging from 4 quarters to 20 quarters. Other investigators have found a 12-quarter lag also worked best for the period of the 1970s. We omit other variables, such as velocity of circulation, because the regression is designed to measure the trend or underlying rate of inflation that is to serve as a benchmark. Additional explanatory factors can be added as required when the actual inflation rate deviates from the trend rate.

The equation (in logarithms), for the period 1959:I to 1981:II, relating the quarterly change in the implicit deflator to a 12-quarter moving average of the quarterly change in money (defined as M1 for the years 1956-1958, thereafter as M1B) is (t values shown in parentheses):

$$\ln P_t - \ln P_{t-1} : \begin{matrix} -0.00208 \\ (-1.335) \end{matrix} + \begin{matrix} 1.18871 \\ (9.682) \end{matrix} \left[\frac{\ln m_t - \ln m_{t-1}}{12} \right]_{t-1}$$

$$\begin{aligned} R^2 &= 0.7669 \\ \text{SEE} &= 0.0034 \\ \text{DW} &= 2.081 \\ \rho &= 0.407 \end{aligned}$$

The t value is a test statistic for the statistical significance of the regression coefficient. A value greater than 2 generally indicates a significant coefficient.

R^2 measures the proportion of the variation of the dependent variable (the inflation rate) which is explained by variation of the independent variable (lagged money growth).

DW is the Durbin-Watson Statistic, a test statistic for the presence of serial correlation. A value close to 2 generally indicates the absence of serial correlation.

ρ (rho) is the first-order serial correlation coefficient. It measures the correlation coefficient between errors in adjacent time periods. When ρ equals zero, no first-order correlation is present, while a large value of ρ implies the existence of such serial correlation.

The equation uses M1B as the measure of the money stock because it has generally been accepted as the money aggregate most closely related to nominal income (GNP in current dollars) and the price level. Other definitions of money would not significantly alter the result.

5. The equation on which the predicted inflation rate is based was estimated using the Cochrane-Orcutt procedure -- a method

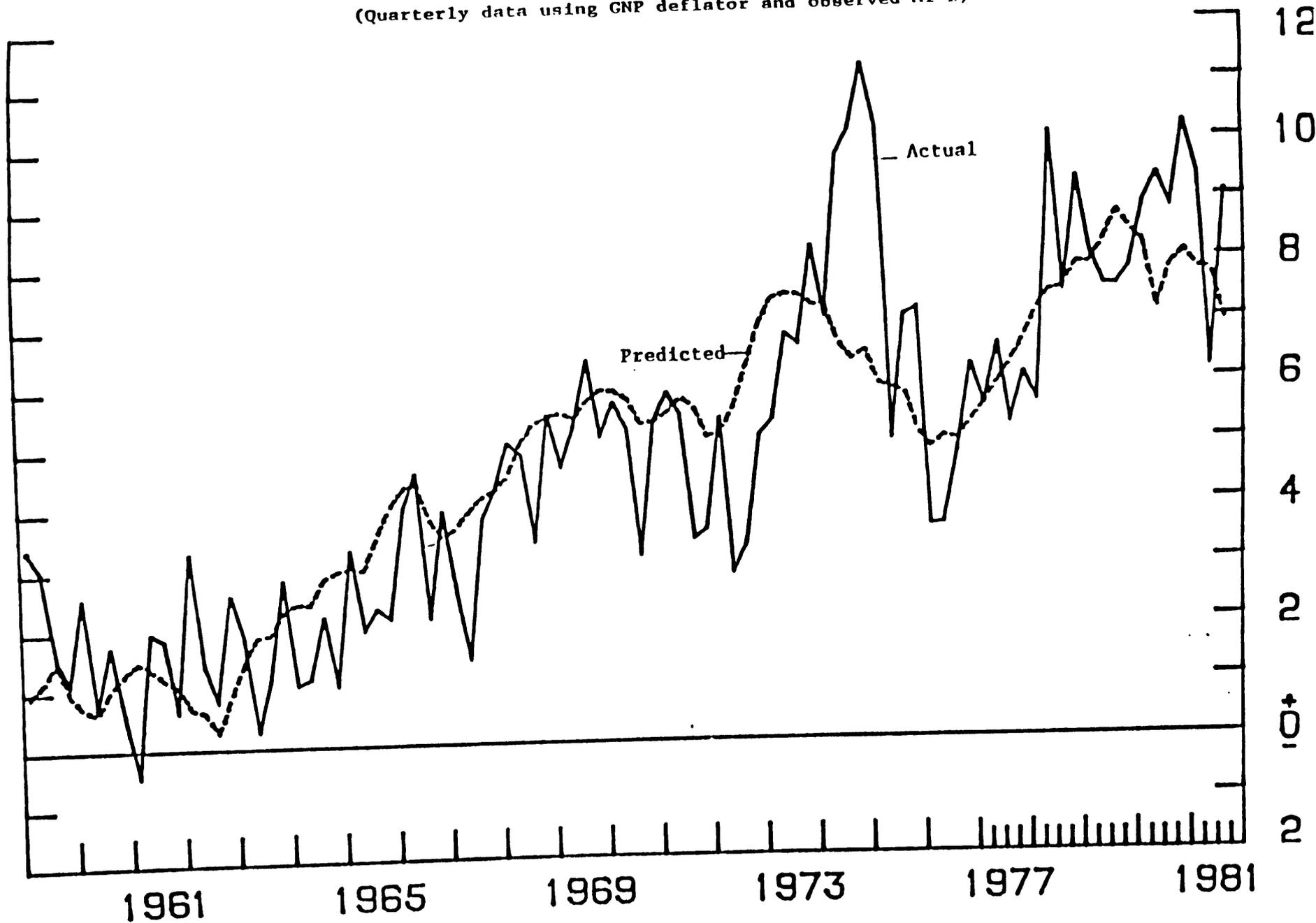
to correct for serial correlation in time series regression models. This is a standard statistical technique. One interpretation of the predicted inflation rate so constructed is that it represents not only monetary influences but other unspecified influences as well. An alternative interpretation is that the Cochrane-Orcutt procedure corrects for lagged inflation or lagged money growth not represented in the underlying equation. There is no basis for choice between the two interpretations. If the first interpretation is accepted, omitting the correction for serial correlation in the estimation of the equation on which the predicted inflation rate is based, the predicted inflation rate will represent only the influence of money. Figure 1-A-1 repeats Figure 1-2, except that the predicted inflation rate omits the autocorrelation correction. It does not appear that the omission of the autocorrelation correction in generating the predicted inflation rate in Figure 1-A-1 obliterates the general relationship between actual and predicted inflation rates. The exceptions remain the years 1974-1975 and 1979-1980.

The relationship when the equation is estimated for the full postwar period will reveal exceptions reflecting disturbances special to the pre-1961 period, such as the impact of price decontrol after World War II and the Korean war episode, but these exceptions are fully consistent with the views expressed by Chairman Volcker in the text quotation.

FIGURE 4-1
ACTUAL AND PREDICTED INFLATION,¹ 1959-1981

Annualized
Logarithmic
Growth Rates

(Quarterly data using GNP deflator and observed M1-B)



1/ Without first-order error autocorrelation correction.

6. It would have been desirable to include, in addition to the Federal budget deficit as a ratio to GNP, the high employment budget deficit as a ratio to the high employment GNP. However there are no continuous estimates of the high employment budget and high employment GNP for the two decades covered by Table 1-1. The definition of the high (or full) employment budget has changed over time. The concept is designed to show what the surplus or deficit in the budget would be if the economy were moving along its potential growth path free of fluctuations in business activity.

The definition of the balance of payments used in the table puts changes in international reserves below the line and focuses on the change in reserves as a product of the overall balance of payments deficit.

7. See Michael R. Darby, "Price and Wage Controls: The First Two Years," and "Price and Wage Controls: Further Evidence," in The Economics of Price and Wage Controls, K. Brunner and A.H. Meltzer, eds., Carnegie-Rochester Conference Series on Public Policy, vol. 2, 1976, pp. 235-63; 269-71; Alan S. Elinder and William J. Newton conclude that "catchup inflation caused by the ending of controls carried the price level permanently 1 percent above what it would have been without controls." See "The 1971-1974 Controls Program and the Price Level: An Econometric Post-Mortem," NBER Working Paper no. 279, September 1978.

8. R.J. Gordon, "World Inflation and Monetary Accommodation in Eight Countries," Brookings Papers on Economic Activity (1977:2): 409-68; and W.A. Niskanen, "Deficits, Government Spending, and Inflation: What is the Evidence?" Journal of Monetary Economics 4 (August 1978): 591-602, dispute the validity of the link. W.D. McMillin and T.R. Beard, "The Short Run Impact of Fiscal Policy on the Money Supply," Southern Economic Journal 47 (July 1980): 122-35; and M.J. Hamburger and B. Zwick, "Deficits, Money and Inflation," Journal of Monetary Economics 7 (January 1981): 141-50, find a significant impact of deficits on monetary growth.

Phillip Cagan holds that the nominal deficit expressed as a percentage of GNP is overstated in real terms (see "The Real Federal Deficit and Financial Markets," The AEI Economist (November 1981): 1-3). This is so because interest payments on the Federal debt, which are reflected in the deficit, include compensation for the depreciation of the debt in real terms. Hence the deficit should be reduced by the product of the federal debt in private hands and the rate of inflation. Expressing the deficit minus the decline in the real value of the Federal debt as a percent of GNP reduces the nominal deficit considerably.

9. L.O. Laney and T.D. Willett, "Presidential Politics, Budget Deficits, and Monetary Policy in the United States: 1960-1976," Claremont Working Papers (1981).

10. R.J. Barro, "Comment from an Unreconstructed Ricardian," Journal of Monetary Economics 4 (August 1978): 569-81.
11. In the source cited in note 8 above (pp.3-5), Phillip Cagan adjusts the Federal budget deficit for the expected repayment of principal, on the assumption that the inflationary premium embedded in interest rates since the 1970s is equal to the depreciation in the value of the Federal debt due to inflation. On the further assumption that debt holders regard these additional interest payments as a return of principal rather than as income and therefore not to be consumed, they will reinvest the additional interest to maintain the principal of debt intact. The reinvestment will finance, without crowding out, an amount equal to the depreciation in the real value of the debt.
12. Marc Miles, "Currency Substitution, Flexible Exchange Rates, and Monetary Independence," American Economic Review 68 (June 1978): 428-36, found evidence that currency substitution was significant for the Canadian demand for money. However, M.D. Bordo and E. Choudri, "Currency Substitution and the Demand for Money: Some Evidence for Canada," Journal of Money, Credit and Banking 14 (February 1982): forthcoming, find Miles's model to be misspecified and demonstrate that when the demand for money is properly specified, the influence of currency substitution (measured by expected changes in the exchange rate) is negligible. Bruce Brittain, "International Currency Substitution and the Apparent Instability of Velocity in Some

Western European Economies and in the United States," Journal of Money, Credit and Banking 13 (May 1981): 135-55, found evidence for the significance of currency substitution for some countries but not for others.

Chapter 3 .

Types of Monetary Standards

The original meaning of the term monetary standard was that a particular weight of either gold or silver served as the supreme form of money with which all lesser forms of money were interconvertible. The term has since come to be used as meaning a monetary system, that is, the institutions and practices relating to payments for the settlement of debts. In this chapter, we examine the character of various types of monetary standards, including some of which we have no examples in modern times.

I Alternative Standards

A monetary standard has two aspects, one domestic and one international. The domestic aspect applies to the arrangements regulating the quantity and growth rate of the internal money supply. The international aspect applies to the arrangements by which the external value of the currency is determined. These two aspects are present for any type of monetary standard.

The two broad divisions of monetary standards are commodity and paper standards. Commodity standards may be based on metals, other commodities, or baskets of commodities including metals. Metallic commodity standards have usually been based on silver or gold or a combination of both known as bimetallism.¹ We limit our examination of metallic standards to variants of the gold standard before turning to the examination of other commodity standards and of paper standards, commenting first on domestic and then international aspects of each. Finally, we consider the strengths and weaknesses of the gold standard variants as a

group, of other commodity standards, and of paper standards.

A. Variants of the Gold Standard

The basic argument that is offered in support of all variants of a gold standard is that gold has intrinsic value and therefore serves as a standard of value for all other goods. In addition, supporters view gold as a store of value because new production adds only a small fraction to the stock accumulated over centuries, hence prices denominated in terms of gold will not vary greatly from year to year. If other forms of money exist, for example, government-issued or bank-issued paper currency and bank deposits, then convertibility into gold at a fixed price would assure that, even if inflationary policies were adopted, the monetary authorities would be compelled to abandon such policies. An increase in government paper currency would tend to raise prices in terms of paper currency, would reduce the purchasing power of paper currency, and induce money holders to convert their paper dollars to gold, putting pressure on the government's gold holdings. At the same time, with gold as a country's reserve asset, adjustment to balance of payments deficits and surpluses would be automatic. Thus an increase in the domestic money supply by ultimately raising the price level would raise the price of exports relative to the price of imports, leading to a balance of payments deficit and a gold outflow. In addition, the increase in the money supply would lower domestic interest rates relative to those abroad, inducing a capital outflow and a further gold outflow.

Another attribute claimed for gold standards is that the rate of increase in the gold money supply would vary automatically with the profitability of producing gold, and hence assure a stable money supply and stable prices at least in the long run. Thus, a rapid increase in the output of gold, due to gold discoveries or technological improvements in gold mining, would raise the prices of all other goods in terms of gold, making them more profitable to produce than gold, and ultimately leading to a reduction in gold output. Moreover, the initial reduction in the purchasing power of gold would lead to a shift in the demand for gold from monetary to nonmonetary use, thus reinforcing the output effects. Conversely, a decline in prices of goods and services, due to technological improvements in the nongold sector, would increase the profitability of gold production, encouraging increased gold output, which would ultimately tend to raise the price level. The initial increase in the purchasing power of gold would also lead to a shift in the demand for gold from nonmonetary to monetary use, thus reinforcing the output effects. Long-run price stability would be the result.

Gold standards vary depending on the presence or absence of the following elements:

1. a national money unit
 - a. present
 - b. absent
2. Nongold national money issued by either the government or by a fractional-reserve commercial banking system

3. a central bank
 - a. with gold reserves only
 - b. with mainly foreign exchange reserves
4. convertibility of nongold money into gold coin or gold bars
5. classes of holders for whom nongold money is convertible
 - 1a. 100 per cent gold coin standard with national money

Under such a standard, the national unit is defined as a specific weight of gold which thus sets the price of an ounce of gold in terms of that unit. There are 480 grains of gold in a fine troy ounce. Dividing 480 grains by the weight of the national unit in gold yields the price. Defining a dollar, for example, as 11.368 grains of gold sets the price of an ounce of gold at \$42.22+. Under a 100 per cent gold coin standard, gold would be money, but prices would be expressed in terms of the national unit -- dollars, pounds, marks, or francs. Banks would exist to issue warehouse receipts for gold in the national money unit and would hold 100 percent reserves. Terms of loans by the banking system and others would be expressed in the national money unit. Exports or imports of gold coin would be unlimited and free of taxes and restrictions.

The supply of money and the prices of goods in terms of that money would be determined in the market by the demand for gold for monetary and nonmonetary uses and by the supply of gold, which would be governed by the opportunity cost of producing gold. The demand for gold for nonmonetary use would be governed by the relative price of monetary gold and all other commodities.

The demand for monetary gold would be governed by (a) total wealth available to hold in asset form; (b) the total amount of goods and services produced; (c) the average price of those goods and services; (d) the return on holding monetary gold relative to the return available on alternative assets; and (e) the tastes and preferences of holders of money.

In this system, the market would be free to choose forms of money other than gold and warehouse receipts.

Government intervention in the monetary system would be limited to its undertaking to buy gold from the public at a fixed price and converting it into coin, and to sell gold to the public at a slightly higher fixed price, if it so chose, the difference between the two prices representing brassage -- the government production fee to cover cost of coin manufacture.

The determination of the external value of a national currency under a 100 per cent gold coin standard may be explained with an example drawn from a variant of the gold standard to be discussed below. The principle is the same for all variants based on a national monetary unit.

The external value of the currency is fixed in terms of gold. For example, consider the reason the external value of a dollar in terms of a pound sterling was \$4.8665 before World War I and from 1925 to 1931. The dollar was defined as 23.22 grains of fine gold and a pound sterling as 113.0016 grains of fine gold, hence 4.8665 was the multiple of the weight of gold in a pound sterling compared with the weight of gold in a dollar. This was

a fixed exchange rate because the gold weight of each currency was fixed or, equivalently, the price of gold per ounce was fixed. If the United States had adopted one price of gold and the British another price, obviously, the equivalence between the exchange rate and the respective weights defining each currency would have disappeared. A variable price of gold among countries would have meant variable weights of gold represented by each currency.

The link between currencies is gold at a fixed price. Imbalances in international payments might be settled by claims on the national currencies of other countries which had fixed gold equivalents, financed in the example cited mainly by the use of bills of exchange. If the demand for and supply of a national currency did not balance, gold flows would be activated. Thus whenever the dollar price of a British pound at the official or par exchange rate of \$4.86 deviated by more than one or two per cent above or below par (these limits, referred to as the gold points, represented the cost of transferring -- packing, shipping, and insuring -- gold between the two countries), it paid either to convert U.S. dollars into gold and transfer it abroad, or else to convert British pounds into gold and transfer it here. If U.S. demand increased, for example, for cheaper British goods, this raised the dollar price of the pound (that is, bills of exchange). Once the dollar price of the pound reached \$4.92, referred to as the U.S. gold export point, it paid to convert U.S. dollars into gold, ship the gold to England and

purchase pounds at \$4.86. Conversely, at the U.S. gold import point, which might have been as high as \$4.83, it paid to convert pounds sterling into gold, ship the gold to the U.S., and purchase dollars. Gold shipments in either direction would then act to restore the price of foreign exchange to parity.

Thus it is not only gold flows from new gold output but inflows or outflows related to movements in the balance of payments that affect the size of the domestic money supply. A reduction in a country's domestic money and ultimately in its price level enhance the country's appeal as a source of goods and services to foreigners and reduce domestic demand for foreign goods and services. An increase in a country's domestic money and ultimately in its price level diminish that country's appeal as a source of goods and services to foreigners and increase domestic demand for foreign goods and services. Thanks to this automatic adjustment process, the duration and size of imbalances of international payments would tend to be self-limiting. Gold flows serve to equalize price movements across countries.

Economists debate the details of the process just described.² Some argue that gold flows under the gold standard before 1914 were minimal and that prices worldwide adjusted rapidly. There was one world price level and the internal adjustment process posed no greater problem than interregional adjustment of prices within a country. These are refinements that need not detain us.

1b. Gold standard without national money

The key feature of such a standard is that the role of government in it at most would be limited to assuring the weight and fineness of coins minted by the private sector. No national money unit would exist -- no dollars, pounds, marks, or francs. Coins of different weights would circulate and prices would be denominated in weights of gold. Banks might exist to issue warehouse receipts for gold with a cover of 100 percent reserves. Borrowing and lending, limited to the private sector, would be conducted, the debt instruments denominated in weights of gold. Settlement of international payments would rarely be made in weights of gold. Instead, international capital flows would occur in the form of interest-bearing debt instruments, denominated in weights of gold, or the transfer of ownership of equities to foreign holders.

The proponents of the conception of the gold standard here sketched regard it as superior to any other form of monetary standard because it eliminates money creation by both government and banks. In their view the record of government and banks shows them to have overissued the currency. In a real gold standard, such as the one described, the quantity of gold available for monetary use would determine the level of prices. If the demand for gold exceeded the supply, prices, expressed in weights of gold, would fall.

In the ideal arrangement that is proposed, the market might choose forms of money other than gold and warehouse receipts,

including promises to pay gold on demand or at a future date. Private contracts would specify payment in whatever form was mutually agreeable, including the use of technological means for electronic transfer of funds that could significantly economize the means of making payments with physical gold or the need to hold gold in physical possession.

Introducing de novo a real gold standard would clearly change the character of the existing political and financial system.

2. Gold standard with nongold money issued by either the government or a fractional-reserve commercial banking system

The earliest departure from the ideal 100 per cent gold coin standard was the creation of substitutes for gold. The motive for substitution was a reduction in the real resources employed in mining gold. Paper money substitutes may be produced with much smaller real resources. Such substitutes included fiat currency issues by governments and commercial bank issues of notes and deposits, with gold reserves of the government and banks equal to a fraction only of their monetary liabilities. The incentive to limit the size of the fraction of gold reserves was strengthened during trend periods when the supply of gold did not keep pace with the demand for it for monetary and nonmonetary uses.

Fractional gold reserves were held as an earnest of issuers' readiness to convert nongold money into gold at the pleasure of the holder, at a fixed price of gold, not a changing market price of gold. In this system, domestic disturbances, such as banking

panics, could affect the size of the country's gold reserves. Public alarm about the adequacy of the gold reserve ratio could trigger an internal drain of gold, when holders chose to shift from bank notes or bank deposits to gold. In the aftermath of such episodes, an increase in the gold reserve ratio was produced usually by a contraction of the issuers' monetary liabilities.

A fractional reserve gold standard accentuated the effects of gold flows on the quantity of money. A one-dollar gold inflow, depending on the size of the reserve ratio, might increase the domestic quantity of money as much as \$8 or \$10, a one-dollar gold outflow might reduce the quantity of domestic money by as much as \$8 or \$10, with parallel effects on domestic spending and prices.

However, as noted above, international capital flows alleviated to some extent either the size of gold flows or their consequences. Short-term capital flows served to reduce and smooth the immediate flows of gold that would otherwise have been required to settle payments imbalances. Long-term capital flows enabled developing countries to borrow real resources from developed countries by running a persistent excess of imports of goods and services over exports of goods and services without entailing gold flows. In the event of a rise in the domestic quantity of money, in the short run, interest rates would tend to decline, inducing investors to shift funds to foreign money markets. The size of the change in export prices relative to import prices that would otherwise have occurred would be reduced

by the resulting gold outflow.

In a fractional-reserve banking system and a gold standard with a national money unit, domestic and international convertibility of claims on the monetary authorities was the mechanism to insure that nongold money growth was held in check.

3a. Gold standard with a central bank holding gold reserves only

Central banks in Europe predated the gold standard. Their behavior did not always serve the discipline the ideal gold standard imposes. They did not necessarily respond to a loss of gold due to balance of payments deficits by actions to reduce the domestic quantity of money outstanding, or to a gain of gold due to balance of payments surpluses by actions to increase the domestic quantity of money outstanding.

Scholars continue to debate the extent to which such behavior by the Bank of England and other central banks characterized the period before 1914. After World War I, the issue is not in doubt: central banks, including the Federal Reserve System, frequently chose not to permit gold flows either to expand or contract the domestic quantity of money, or to do so to a lesser degree than full adjustment would have required. The gold standard was not automatic but managed.

3b. Gold standard with a central bank holding mainly foreign exchange reserves

Central banks also learned to economize on gold holdings by using other currencies as reserve assets, principally sterling before 1914, increasingly dollars thereafter. A country that

holds all or a large part of its monetary reserves in the form of foreign exchange, that is, claims on a country that is on a gold standard, is said to be on a gold exchange standard. Gold holdings are non-earning assets. For that reason the gold exchange standard has appeal since foreign exchange, in the form of deposits at foreign banks or foreign treasury bills, provides earning assets. Of course, a country holding foreign exchange reserves in a currency that devalues sustains losses.³

The gold standard before World War I was often described as a sterling/gold exchange system, under the Bretton Woods system after World War II as a dollar/gold exchange system. Both were fixed exchange rate systems in conception, but the Bretton Woods system became an adjustable pegged exchange rate system.

The par value of each national currency was expressed either in terms of gold or in terms of the U.S. dollar of 13.71 grains of fine gold, each established in agreement with the International Monetary Fund. Members of the IMF were responsible for maintaining the par value of their currencies, with the United States alone undertaking the free purchase and sale of gold at the fixed price of \$35 per ounce. Other countries bought and sold their currencies for dollars to maintain their par values within agreed limits. Settlement of international payments imbalances took place mainly by transfers of reserve assets in the chief money markets.

The system was characterized by repeated foreign exchange crises as market participants anticipated that existing par

values were unsustainable and shifted funds from a weak currency to a strong currency, exacerbating the domestic position for both currencies. Countries with undervalued currencies resisted revaluation and countries with overvalued currencies resisted devaluation.

The system of fixed but adjustable pegged exchange rates collapsed under the pressure of persistent deficits in the reserve center country's balance of payments that produced inflationary pressures on the rest of the world. The U.S. money supply grew at rates independent of the country's balance of payments position, contrary to the case under an international gold standard. Dollar reserve accumulations abroad, unless sterilized by monetary authorities, expanded the monetary bases of our trading partners. According to them, the United States exported inflation to the rest of the world through its balance of payments deficits.

4. Gold standard with convertibility of nongold money into gold coin or gold bars

In the gold coin standard with a national money unit and nongold substitutes, such as existed in a number of countries before 1914, gold coin circulated -- usually a minor fraction of aggregate domestic money -- and nongold money was redeemable in coin. Again, as a way of economizing on the use of gold, many countries ceased to coin gold after 1914 (the United States, not until 1933). Thus free coinage, circulation of gold coins, and the legal tender status of gold coins terminated. The aim was to

concentrate all of a country's gold holdings into reserves available for international payments. Nongold money became convertible into heavy gold bars. Such a gold standard is known as a gold bullion standard.

5. Gold standard with classes of holders for whom nongold money is convertible

Under a gold coin standard with a national money unit and nongold substitutes, all holders of nongold money -- domestic and foreign -- could convert it into gold coin. Under a gold bullion standard, convertibility could exist for both classes of holders. Under the Bretton Woods dollar/gold exchange standard, convertibility in the United States was limited to foreign official institution dollar assets. Foreign institutions willingly held dollars for the purpose of intervention so long as they were confident that they could obtain gold from the United States for dollars at their initiative. A gentleman's agreement among central banks not to present dollar balances for convertibility into gold for a time staved off the denouement. The chronic deficits in the U.S. balance of payments and the unwanted accumulations of dollars by foreigners which threatened to drain all U.S. gold finally led to formal inconvertibility for all holders in 1971.

B. Variants of Other Commodity Standards

Economists have long argued that a commodity standard with a bundle of commodities is superior to a single commodity standard like the gold standard.⁴ The reason is that such a

scheme could mitigate the price level instability produced by basing the standard on one commodity like gold, produced by unexpected changes in its demand and supply. Technologically induced changes in relative costs of production of some of the bundle would be offset in the rest of the bundle.

The usual prescription for the bundle of commodities is that it would include standardized staples like metals and manufactured commodities that are traded in broad markets. The precise composition varies with the author of the plan for a commodity standard. In support of such a standard, it has been argued that possible monetization of the bundle of commodities would provide producers with a floor to their incomes, while convertibility into currency would impose a ceiling on the market prices of the bundle.

If nonmonetary stocks of the commodities available for use as monetary stocks were small, the quantity of money would change primarily through additional current output or withdrawals for current use. Since the commodity industries represented in the bundle would have a fairly elastic current output, any decline in other prices would induce a substantial increase in their output, adding to the stock of money and current income. Opposite effects would occur with any rise in other prices. Changes in the quantity of money would affect the volume of real assets held by the public and the fraction of total assets held as money, causing the community to alter their expenditures in a countercyclical fashion. Thus, commodity currency could have

substantial countercyclical effects.

Plans for a commodity standard differ on the rôle of government and the provision for a reserve. The government's role could be limited to the announcement that the monetary unit is defined as specified amounts of each of the bundle of commodities. The private sector would then issue financial instruments denominated in the unit. The government would have no role as an issuer of currency. Some plans envisage no government reserves of the bundle of commodities. Instead, the private sector would hold reserves in order to redeem the financial instruments -- say, warehouse receipts for the bundle -- issued by it. Again, fractional reserve holding might well be a development of a commodity standard, given the incentive to reduce resource costs of holding 100% reserves.

Private individuals would use the warehouse receipts to obtain from the issuers commodities covered by the standard and sell to the issuers for warehouse receipts commodities covered by the standard. A deflationary tendency would encourage production of the commodity bundle that would be exchanged for newly issued warehouse receipts at the fixed price, thus countering the initial tendency. An inflationary tendency would lead private individuals to redeem the warehouse receipts in commodity bundles, thus countering that tendency. In this way, self-interested actions by individuals in the economy would maintain the stability of the price level and so preclude deviations in the price level over the long run.

If a commodity standard were adopted internationally, it could provide an international currency with fixed exchange rates.

C. Paper Standards

Under a paper money standard, it is essential to anchor the system to a nominal fiat reserve - what economists call "outside" money, provided by a central bank, another governmental agency, or even a nongovernmental agency. In our paper money system, the monetary base of the Federal Reserve System serves as outside money. First, we examine current monetary arrangements and then, by contrast, arrangements that would prevail under a radical restructuring of the monetary system.

1. Current Monetary Arrangements

Our current monetary arrangements rely on the discretion of the Board of Governors of the Federal Reserve System. To insulate the Board from short-run political pressures, safeguards are provided by the staggered 14-year terms of the governors, the decentralization and somewhat autonomous regional Reserve Banks, the independence from Congressional appropriations, and the Federal Advisory Council as a watchdog. Congress has no direct supervisory authority over either the Board or the Reserve Banks, although the chairman of the Board testifies frequently before various Congressional committees.

It is the responsibility of the Federal Reserve Banks to provide without limit the amount of paper currency that the public demands. A limit on the quantity of paper money that the Federal

Reserve could print existed before 1968 when it was required by law to keep a 25 percent gold backing for each dollar it issued. Instead of controlling the amount of currency in circulation -- it now constitutes about one-third of the money supply defined as the sum of currency and all demand deposits -- the Federal Reserve attempts to control the demand deposit component of the money supply.

The most important tool the Federal Reserve possesses for monetary control is its portfolio of government securities. It is through increasing and decreasing its holdings of government securities that the Federal Reserve is able to effect changes in the reserve positions of banks. When the Federal Reserve buys government securities, it pays for them by adding to bank reserves. Federal Reserve sales of government securities reduce bank reserves. Banks expand their lending activities, and hence increase demand deposits, when their reserves increase. The opposite effects occur when their reserves decrease. Changes in its portfolio thus enable the Federal Reserve to control, over a period long enough for the banks to react, the amount of demand deposits created by the banks.

Currently, the dollar's foreign exchange value is determined by changing supply and demand in the foreign exchange market, whether because flows of goods and services to and from other countries vary, long-term or short-term capital movements, or interventions by monetary authorities to influence the foreign exchange rate of their currencies vis-a-vis the dollar.

2. Radical Proposals

Radical proposals to change current monetary arrangements, while maintaining a paper standard, derive from concern over the record of monetary instability associated with the operation of paper money standards. Proposals for reform range from the introduction of 100% reserve requirements for banks of issue, to rules limiting the discretion of the Federal Reserve System in creating reserves for the banking system, to proposals by F.A. Hayek and others calling for the free private production of money and currency competition among issuers of money.⁵

Advocates of basing monetary policy on a rule, such as requiring the Federal Reserve to increase the money supply at a fixed rate, contend that such a policy would promote price stability and dampen cyclical changes in the economy. For them, discretion is politically and economically objectionable.

Suggestions for improving the performance of our paper standard include introducing 100% reserve requirements for banks, payment of interest on bank reserves, and payment of interest on demand deposits. The advantage of a 100% reserve requirement is that it would reduce monetary instability by eliminating fluctuations in the banks' reserve-deposit ratio and the public's currency-deposit ratio that currently introduce some slippage between the Federal Reserve's provision of reserves and the change in deposits the banks create. By paying interest to banks on their reserves, the incentive to evade the requirement would be largely eliminated. Moreover, by paying interest on demand

deposits, individuals would hold the optimum quantity of money in their circumstances. If interest is not paid on deposits, individuals must take into account the return they could earn on interest-bearing assets, reducing cash holdings by employing, say, more bookkeeping services to compensate for the loss of not holding the alternative asset. Since money is costless to produce, holding smaller than optimum balances is a wasteful use of real resources.

In the schemes for free competition in money, private issuers would be free to produce as much of their money as they wished and users of money would be free to choose whichever currency suited them best, presumably one with stable buying power. Currency competition would be compatible with any exchange rate regime, either flexible or fixed. The advocates of free currency competition regard it as needed to achieve price level stability, as leading to optimum currency areas, and eventually to currency unification, as users of money choose the most useful money.⁶

II. Strengths and Weaknesses of Alternative Standards

We prefix an evaluation of the strengths and weaknesses of the three types of monetary standards we have described by the tabular presentation in Table 3-1. It lists seven criteria of desirable attributes of a monetary standard:

- a. flexibility, that is, the ability to accommodate real economic growth as well as financial innovation
- b. resistance to domestic and foreign shocks both of a monetary and nonmonetary character

Table 3-1

Criteria for Evaluating Alternative Monetary Standards^a

Monetary Standard	Flexibility	Resistance to Shocks	Freedom from Manipulation	Low Resource Costs	Long-run Price Predictability	Long-run Price Stability	Short-run Economic Stability
A. <u>Gold</u>							
1. Pure variants	X	X	✓	X	✓	?	X
2. Classical variants	X	X	X	b	✓	?	X
B. <u>Commodity</u>	✓	X	✓	X	✓	✓	?
C. <u>Paper</u>							
1. Current	✓	✓	X	✓	X	X	?
2. Radical variants ^c	?	✓	✓	✓	?	?	?

^a Check means standard satisfies condition, X means it does not; question mark indicates effects are uncertain

^b Resource costs were reduced in variants of the classical gold standard, particularly so for countries on the gold exchange standard

^c Competing monies variant

- c. freedom from political manipulation
- d. magnitude of associated resource costs
- e. provision of long-run price predictability, in the sense of mean reversion of the price level
- f. provision of long-run price stability
- g. provision of short-run economic stability, that is, stability of prices and real output

A check in a column of the table indicates that the standard satisfies the criterion, an x indicates that it does not, and a question mark indicates that the effects are uncertain.

A. Gold Standard Variants

1. The pure gold coin standard: a 100% gold coin standard (a) with national money and (b) without national money

Since we have no empirical basis on which to form a judgment with respect to the qualities of a 100% gold standard with or without a national money unit, our evaluation is based on theoretical considerations.

Both standards, in common with all commodity standards, would be free from political manipulation but, on the other hand, would exhibit a number of negative features. These include high real resource costs of their establishment and operation; inability to accommodate real growth if technological progress in gold mining and new mine discoveries do not keep pace with the growth of the rest of the economy; long-term inflationary or deflationary movements of the price level, depending on the rate of growth of the monetary gold stock relative to the demand for gold; suscep-

tibility to shocks from both home and foreign changing conditions of supply and demand, each of which in turn could produce short-term economic stability.

If the standard with or without a national money unit literally were limited to or based on the existing gold stock in a country plus annual additions from gold output, long-term inflationary or deflationary movements of the price level would be possible, depending on the rate of growth of the monetary gold stock relative to the demand for gold. These movements impose costs on the economy. It matters little if a loan contract is denominated in a weight of gold rather than a nominal dollar amount if the conditions ruling when the contract is entered into have changed when the terms of the contract have to be fulfilled. Lenders or borrowers can be harmed, depending on whether inflationary or deflationary forces prevail. Foresight with respect to future long-term changes in demand for or supply of gold exceeds investor capacity to encompass in a loan contract. This aspect of a gold standard cannot be neglected.

One other aspect of a gold standard with or without national money is that the traditional view that gold production varies positively in response to changes in its real price does not appear to be true currently (see Chapter 4). On the supply side, South African mines produce less when the price is high because they can work poorer ores. Nor does it seem to be the case currently that an increased real price of gold leads to shifts from nonmonetary to monetary stocks. If the price of gold were

fixed and inflationary expectations vanished, it is conceivable however, that the responses on the supply and demand sides might change.

Another feature of the two theoretical variants invites comment -- the feature that allows for possible introduction by the market of fiduciary monies by issuers who promise to pay gold by weight or in coin of the realm on redemption. If such monies were not always redeemable, as the issuer promised, it is likely that government would become involved in the money creation process if only to enforce contracts and to prevent fraud.

Moreover, when an issuer fails to fulfill his promise to those who entered into a contract with him, third-party effects also occur -- the holder of the monies will default on payments owed by him to third parties. For this reason, government is likely to be drawn into the money creation process in order to set limits on the size of the fiduciary issue and otherwise regulate promises to pay gold. The rationale for a gold standard without national money as free from government intervention is weakened by the feature in question. It undermines the case for a 100% gold coin standard.

This feature also has a bearing on the claim made that high resource costs are a positive value of gold standards. If this were so, they should not occasion the introduction of substitutes for gold in circulation and in reserves. To suggest that markets might introduce such substitutes in the ideal gold standards belies the claim made for the beneficence of high resource

costs. The market will seek means to achieve at lower resource costs what the gold standard is designed to achieve at much higher resource costs.

2. Variants of the classical gold standard

We can summarize the strengths of the gold standard variants of historic experience, and we can then inquire why, given these advantages, the United States and the rest of the world retreated from them.

We note the following advantages conferred by a gold standard. One: A gold standard promotes long-term domestic and international price predictability. This condition provides incentives to private market agents to make long-term contracts which are vital for the efficient operation of a market economy. In addition, such long-term price predictability minimizes confusion between relative and price level movements, so that economic agents do not experience false signals with regard to real economic decisions. Two: Government intervention in the determination of the price level and overall level of economic activity is limited under a fully functioning gold standard. Three: Fixed exchange rates create the efficiencies of a stable international money that integrates the world's commodity and capital markets.

The short explanation of the world's retreat from a gold standard, given its advantages, is that, whether advisedly or not, the world came to prize other goals than those of the gold standard. All gold standard countries confront destabilizing

conditions on the supply side, due to gold discoveries, and on the demand side, due to the spread of the gold standard when additional countries adopt it. Improving the real performance of the economy was given pride of place. To achieve the improvement, the task was assigned to government management of monetary and fiscal policy, rather than to private sector initiatives. Only the role of fixed exchange rates carried over to the postwar world but fundamentally divorced from the gold standard restraints. Under Bretton Woods, there was no provision that the internal supply of a country's currency was to be governed by its gold holdings, as was the case under the gold standard, nor was there a requirement that a country had to undergo deflation or inflation domestically to balance its external accounts. This dilution of gold standard discipline is an example of its institutional vulnerability. The gold standard was abandoned for shorter or longer periods whenever adherence to it was deemed costly.

The goal of stabilizing the real performance of the economy in the postwar period seemed incompatible with the gold standard. A fully functioning gold standard requires short-term adjustment of the domestic economy to correct balance of payments disequilibria. Such adjustments entail short-term price instability and short-term output instability, which means fluctuating employment. In addition, fixed exchange rates transmit real disturbances in one country to the rest of the world. A timely example is the size of adjustment costs that would have occurred,

had the world been on fixed exchange rates from 1974 on. The increase in the price of oil led to a redistribution of international monetary reserves from oil-importing to oil-producing nations. Under fixed exchange rates, the domestic price level in oil-importing countries would have been subjected to a massive deflation. More generally, under fixed exchange rates, a boom in one country will lead to an increase in demand by its residents for goods and services in the rest of the world. The opposite will happen in the case of a recession.

For these reasons the value of external stability in maintaining a fixed rate of exchange between the domestic money and foreign moneys came to be regarded as purchased at the cost of instability in the domestic money supply, domestic spending, prices and employment. The simple rule for governments to maintain a fixed price of gold was overthrown in the 1970s, but the seeds of the downfall of that rule were sown earlier in postwar years as country after country opted for monetary independence, full employment and economic growth. Countries rejected the restraints that the operation of a gold standard imposed on the pursuit of these widely supported national objectives. In the United States, where the share of international trade was a minor factor in aggregate national income, the view prevailed that the domestic economy should not be hostage to the balance of payments. Maintenance of the price of gold was not an objective of either the Employment Act of 1946 or the Humphrey-Hawkins Full Employment and Balanced Growth Act of 1978.

B. Variants of Other Commodity Standards

The proposed commodity standards have no empirical counterparts, so we compare their strengths and weaknesses with the gold standard and paper money standards.

Technically, commodity standards appear to be superior to a gold standard because nonmonetary production of commodities that might be included in the bundle is a larger fraction of aggregate output than is nonmonetary production of gold. The broader base might therefore provide a more stable price level under a commodity standard, but it is not obvious that that would be the case. Had prices of commodities been expressed in terms of a currency unit consisting of a bundle of commodities rather than in terms of gold, the general price level probably would have fluctuated as much as it actually did, say, from 1800 to 1950. In addition, changes in the relative cost of the commodities in the bundle, just as changes in the cost of gold, would contribute to price instability. Commodity currency, however, would offer greater countercyclical effects on income and thus on the money supply than would a gold-based currency.

In other respects, the two standards are similar under 100% reserve or fractional reserve arrangements and both can serve as international currencies. The one respect in which a gold standard is clearly superior to commodity standards is that gold commands broad support by many people and European central bank governors as the most trusted money. Commodity standards have no such emotional appeal. Holding stocks of gold may be acceptable

to the public. Holding stocks of useful goods would probably not be understood or countenanced.

If a commodity standard with 100% reserves were set up, it would be preferable to a paper money standard with discretionary control of the money supply. The commodity standard would be separate from the government budget and less subject to overissue. However, it would still be subject to instability reflecting changing relative prices and the risk of deliberate manipulation by countries having monopoly power over one or more commodities in the bundle. For example, if one of the countries on a commodity standard failed to adhere to it, say, by impeding the free movement of the commodities in the bundle among the countries adhering to the standard, the policies of the destabilizing country would have damaging effects on the others. Restrictions on international trade would likely be introduced generally. In addition, if a significant change occurred in either the supply of or demand for one commodity in the bundle which is located primarily in one country, that could lead to instability.

With fractional reserves, there is no clear advantage of a commodity standard over a paper money standard unless adherence to rules were scrupulously observed under the former but not the latter standard. Under the commodity standard, shifts from monetary to nonmonetary stocks of commodities in the bundle change the supply of money. It is an advantage that no such shifts occur under a paper money standard.

The final assessment is that commodity standards are more complex and entail greater resource costs than would exist under a properly managed paper standard.

C. Paper Standards

Paper money is valued only because others will accept it in exchange for valuable goods and services, and not because of any intrinsic value. The chief advantage of all paper standards, including the present one, is that they exact minimum costs in the form of resources used to produce the money supply, and they are sufficiently flexible to accommodate economic growth. Moreover, if accompanied by flexible exchange rates, they can insulate the economy from external shocks.

1. Current Monetary Arrangements

For some observers, the discretionary character of the paper standard is an advantage. Monetary authorities have a choice of policy goals and are free to determine how to use their powers to attain them. As problems change, their goals may change.

Other observers view the historical record of our fractional reserve managed paper money system as one of considerable instability both in the short run and the long run and have advocated a number of proposals designed to reduce:

instability associated with fractional reserve banking
(100% reserve proposal)

instability associated with discretionary policy
(monetary growth rules)

and inefficiencies associated with the costlessness of

producing paper money balances (paying interest on bank demand deposits).

2. Radical Proposals

Finally, we evaluate the case for competing monies. Its principal appeal lies in its reliance on the impersonal forces of the market rather than the monopoly power of government. However, unless brand names can be attached to competing private monies, that is, unless the public can be guaranteed that private money issuers will not overissue for private gain, it seems likely that government regulation will be necessary.⁷ In addition, the optimum currency area (the maximum geographical area over which one money can provide price stability) may be so great that only the governments of very large economies can effectively provide the money supply.⁸ Even those sympathetic to the proposed change may conclude that currency competition will ultimately self-destruct, since one currency will outcompete all others. The money industry is a declining cost industry that is a natural monopoly, which at some stage would be nationalized.⁹

III. Conclusion

Each of the standards has advantages and disadvantages. Existing and historical standards were adopted (evolved) as a response to different economic and social priorities of the period as well as in response to the purely economic considerations of the resource costs involved. Thus the classical gold standard prevailed in a world characterized by free markets, free mobility of labor and capital, and distrust of government

intervention. In this environment, in which national economic growth and high employment were not given the weight assigned to them today, the automatic working of the gold standard was preferred to the "evils of managed money." Hence it is difficult to make the case for one standard over another divorced from the prevailing concerns of the time. Nevertheless, on the grounds of the criteria listed in this chapter, the gold standard may not be the standard best suited to current problems.

Notes to Chapter 3

1. The great English economist Alfred Marshall also proposed a combination of silver and gold that he designated symmetalism. He argued that a bimetallic standard would inevitably degenerate into a single standard of either gold or silver, one metal tending to drive the other out of circulation. Symmetalism was a plan to make a composite bar of fixed proportions of gold of given weight with a weight of silver, say, twenty times greater, the government undertaking to buy or sell on demand the composite bar for a fixed amount of currency. Neither metal separately would be convertible into currency at a fixed rate nor would currency be convertible at a fixed rate into either metal. See Memorials of Alfred Marshall, ed. A.C. Pigou, Macmillan: London, 1925, pp.204-06.
2. See, for example, D.N. McCloskey and J.R. Zecher, "How the Gold Standard Worked, 1880-1913," in J.A. Frenkel and H.G. Johnson, eds., The Monetary Approach to the Balance of Payments, Toronto: University of Toronto Press, 1976.
3. As happened when sterling was devalued in 1949 and 1967.
4. A survey of the pre-1950 literature on commodity standards may be found in Milton Friedman, "Commodity-Reserve Currency," in his Essays in Positive Economics, Chicago: University of Chicago Press, 1953, pp. 204-50. See also Robert Hall, "The Government and the Monetary Unit," unpublished paper #159 of the National Bureau of Economic

Research Inflation Project.

5. See his Choice in Currency, A Way to Stop Inflation, The Institute of Economic Affairs, Occasional Paper 48, London, February 1976; Denationalisation of Money, An Analysis of the Theory and Practice of Concurrent Currencies, The Institute of Economic Affairs, Hobart Paper Special, No. 70, London, October 1976.
6. There is some historical precedent for competing monies. Such a system was quite successful in late eighteenth and early nineteenth century Scotland and in antebellum United States (except for wildcat banks). See Lawrence White, "Free Banking in Scotland Prior to 1844," Unpublished Ph.D. dissertation (November 1981), and Hugh Rockoff, "The Free Banking Era: A Re-examination," Journal of Money, Credit and Banking 6 (May 1974): 141-68.
7. See Benjamin Klein, "The Competitive Supply of Money," Journal of Money, Credit and Banking 6 (November 1974): 423-53.
8. Indeed, many countries in Latin America and the Caribbean have tied their currency units to the dollar. See Michael Connolly, "Optimum Currency Pegs for Latin America," Journal of Money, Credit and Banking 14 (forthcoming).
9. See Roland Vaubel, "Free Currency Competition," Weltwirtschaftliches Archiv 113, 1977, no. 3, pp. 435-61.

Chapter 4

Existing Gold Arrangements, Proposals for Change, and the Gold Market

We begin this chapter with a review of the prevailing set of gold arrangements in the United States. They serve as a benchmark from which we evaluate proposals for change suggested by members of the Commission, witnesses who testified at the hearings we conducted, and interested citizens. We then report our findings on the operation of the gold market as it functioned when the price of gold was pegged by the government and as it has functioned since 1968 when the price of gold was freed to fluctuate in response to changes in demand and supply. We discuss the allocation of the stock of gold between monetary and nonmonetary uses, the determinants of demand and supply, and approaches to the determination of the equilibrium price of gold. We also discuss the record of gold production over past centuries and its relation to trend movements in commodity prices. The chapter concludes with a statistical compendium of time series relating to world and U.S. output and stocks of gold, industrial and investment demand for gold, and the changing nominal and real price of gold.

I. Existing Gold Arrangements

We distinguish the effects of current gold arrangements on operations of the Treasury Department, the Federal Reserve System, and private citizens, and on the conduct of international transactions.

Treasury

The Treasury Department holds most of the United States monetary gold stock in depositories located in Fort Knox, Kentucky and West Point, New

York; U.S. Assay Offices in New York and San Francisco; and the Denver and Philadelphia Mints. The Federal Reserve Bank of New York is custodian of the remainder of the gold stock. In total, the stock amounts to 264 million ounces. The Treasury values the stock at \$42.22 per ounce, the official price that was last set in 1973. To change the fixed dollar price of gold would require Congressional authorization, but the Treasury could choose to revalue the gold stock at changing market prices without legislative approval.

In addition to the stock of monetary gold it owns that is held by the Treasury, the United States has contributed 23.6 million ounces of gold to the reserves of the International Monetary Fund (IMF).

The Secretary of the Treasury is authorized by 31 U.S.C. Sec. 405b to issue gold certificates against any gold held by the Treasury. Public Law 94-564, sec. 8, limits the amount of gold certificates issued and outstanding to the value of the gold held against such certificates, as measured by the par value of \$42.22 per fine troy ounce.

The Treasury currently mints no U.S. gold coins. Indeed, 31 U.S.C. Sec. 315b prohibits the minting of U.S. gold coins for domestic circulation. However, Public Law 95-630 provided that the Treasury strike into medallions each year for a period of five years not less than 1 million ounces of gold to be sold to the public at a price covering all costs. The first issue of medallions was made in July 1980. The five-year period accordingly will terminate in 1985.

Currently, the Treasury has no policy of actively buying or selling gold, but it retains the right, codified at 31 U.S.C. secs. 733 and 734, to sell gold, and with the approval of the President, to purchase gold, at

home or abroad, in such amounts and manner and at such rates as he deems to be in the public interest.

The Secretary of the Treasury, with the approval of the President, is authorized to deal in gold and foreign exchange for the account of the Exchange Stabilization Fund that was created by the Gold Reserve Act of 1934, in accordance with 31 U.S.C. Sec. 822a. The stabilization fund currently has a capital of \$200 million.

Federal Reserve System

Currently, gold serves neither as currency nor as backing for U.S. currency. Public Law 90-269 amended the Federal Reserve Act so as to eliminate the requirement that the Federal Reserve Banks maintain reserves in gold certificates of not less than 25 percent against Federal Reserve notes in circulation. In addition, this Act eliminated the gold reserve requirement for U.S. notes and Treasury notes of 1890. Reserves now consist of bank deposits at the Federal Reserve Banks and vault cash held by banks.

The Federal Reserve System holds as an asset gold certificates issued by the Treasury against its gold holdings valued at \$42.22 per fine troy ounce of gold. The certificates represent a Federal Reserve claim on the Treasury.

Private Citizens

In December 1973, U.S. citizens were permitted to own gold coins minted up to 1959 (before that date, up to 1934), and as of January 1975, to own bullion gold. They have been free to purchase, hold, sell or otherwise deal in gold in the United States and to hold gold certificates. They are also free to manufacture and sell gold medallions and coins. Private

citizens are free to write gold clauses in private contracts and to denominate yields on bonded indebtedness in gold, in accordance with Public Law 95-147. However, they cannot be compensated in current dollar values for gold clauses in obligations entered into before October 28, 1977, when the Gold Clause Resolution of June 5, 1933, which invalidated clauses in private obligations calling for payment in gold, was repealed.

International Transactions

The United States is barred, under present provisions of the Second Amendment to the Articles of Agreement of the International Monetary Fund, and the Bretton Woods Agreement Act, Public Law 94-564, from establishing and maintaining an official value of the dollar in terms of gold for settling international balances. Amendments to the Agreement or an Act of Congress would be required to change the present arrangements. Accordingly, gold does not determine the value of the dollar in terms of other currencies, and it does not serve as an international means of payment.

II. Proposed Changes in Gold Arrangements

We classify the changes in current gold arrangements that have been proposed and brought to our attention in five groups:

- A. A domestic gold standard with a fixed price of gold
- B. An international gold standard with a fixed price of gold
- C. Increased use of gold in domestic Federal Reserve and Treasury operations, but not a return to a gold standard
- D. Increased use of gold in international monetary arrangements, but not a return to a gold standard
- E. Decreased role of gold as a potential policy instrument

We examine the main elements of the proposed changes and evaluate the advantages or disadvantages of each group.

A. A domestic gold standard with a fixed price of gold

To achieve long-run price stability, advocates of a restoration of a domestic gold standard recommend that the Government establish a new official fixed price of gold (that is, define the weight of gold in a dollar) and maintain it by buying and selling gold freely at that price. The Government would also determine a ratio, or upper and lower bounds of a ratio, between the monetary gold stock and Federal Reserve note circulation, or the monetary base, that the Federal Reserve System would be required to observe, reducing its monetary liabilities when the reserve ratio declined, expanding them when it rose. Legal tender gold coins, denominated in dollars, would be issued to serve as hand-to-hand currency and as legal reserves for commercial and other bank deposits. No restrictions would apply to ownership of gold coin or bullion. Nongold currency would be convertible into gold on demand by holders.

To implement a restoration of a domestic gold standard in the United States requires the solution of a series of interlocking problems.

1. The basic problem has been designated the re-entry problem: how to determine the "right" fixed price at which to resume. In the past, when a country reinstated the gold standard, there was an old official price that was once again restored or that served as the base for revaluation or devaluation. There is no comparable old price today. The last official price of an ounce of gold, \$42.22, is so out of line with current market

prices that it provides no guidance. The risk involved in choosing the wrong price is great. An incorrect price might lead to a huge inflow of gold if it were too high, a huge outflow if it were too low.

At least three concrete proposals to solve the re-entry problem exist:

(a) Arthur Laffer proposes that an announcement be made by the Government that some months hence a dollar unit of the monetary base of the Federal Reserve System will be linked to a fixed quantity of gold at that day's average transaction price in the London gold market. That would become the official price of gold in terms of dollars from thenceforth. If it turns out that the price so chosen is too high or too low, the proposal goes on to recommend suspension of convertibility. The procedure is then repeated, with a new announcement that convertibility will be reinstated at a future date at the price then prevailing in the market. The proposal opens up the possibility for instability as speculators bid up the price of gold before the end of the first announcement period. Then if convertibility is suspended because the price turns out to be too high, speculators will unload gold so that the price of gold falls too low before the end of the second announcement period.

A conjecture on how gold holders might react to the announcement by the United States that it will go back to the gold standard at a future date indicates possibly conflicting market reactions.

A fixed price for gold might signify, to those who hold gold in the expectation that it will appreciate, the urgency of selling gold even before the price were fixed. That might lead to a reduction in the market price at the time of fixing. Further sales by such holders once the price had been fixed, if the belief were to prevail that the price would be

maintained indefinitely, would compel the United States to buy gold to prevent a decline in the fixed price. If such sales by those holding gold in the expectation that it would appreciate did not take place, once the intention to fix the price of gold were announced, it would suggest market skepticism that the price, when picked, would be "right."

On the other hand, a fixed price of gold for those who hold it to diversify their portfolios and as a hedge against contingencies might encourage them to increase their holdings in the belief that the price would be maintained.

(b) An alternative proposal to determine the re-entry price has been made by Robert Aliber. Start with the price of gold, when price stability was last known in the United States, say, 1961. Adjust the dollar price of gold in 1961, \$35 per ounce, by the decline in the purchasing power of the dollar in the two subsequent decades. In addition, adjust for real changes in the gold market that have occurred since 1961. In effect, the procedure requires estimation of the parameters of the gold demand and supply functions.

(c) One approach to the problem of the price at which to reinstitute the gold standard seizes on the opportunity the selection offers to adopt simultaneously a 100% gold reserve against the money supply. The price of an ounce of gold is to be determined, under this scheme, by dividing a money aggregate, such as the M1 measure of the money supply, by the number of ounces of gold held by the Treasury. One such calculation yielded a price of ~~\$~~\$1500 per ounce. A variant of this approach divides the world dollar GNP by the world stock of monetary gold, yielding a price of \$3500 per ounce.

2. Even if the fixed price turned out to be "right," a second problem is that a return to a gold standard must be accompanied by a strategy to assure adequate monetary growth. That depends on an adequate supply of gold. World gold reserves above and below ground may seem more than adequate, quoted in billions of ounces, but the flow supply cannot be ignored. The evidence is that gold production responds sluggishly to changes in market price and, since the 1960s, has responded perversely (see section III below). Some observers regard the fact that the bulk of current world gold output is produced by South Africa and the Soviet Union as a harbinger of instability in future gold output.

3. A third problem is the potential for shocks in the gold market at home or abroad. On the demand side, they might arise from changes in the demand for gold for hoarding, and on the supply side, from gold discoveries. Such potential shocks would make it difficult for one country alone to return to the gold standard because it would bear unilaterally the adjustment costs imposed by the shocks.

In the discussion of the gold market below, possible solutions to some of the foregoing problems are examined. Additional problems, however, affect the feasibility of a return to a gold standard.

4. Under a domestic gold standard with convertibility between gold and the dollar available only to citizens of the United States, the problem of how to enforce the limitation of convertibility appears intractable. Citizens might be required to declare under oath that they were acting for themselves or for other citizens, but not for foreigners, when demanding gold or supplying gold at the gold window. Alternatively, gold imports and exports might be embargoed. Opportunities for profitable violation would

arise with discrepancies between the U.S. fixed price and the world market price of gold. In both cases, an enforcement army of inspectors would appear to be needed.

5. A fifth problem concerns international aspects of a unilateral return to a gold standard by the United States. The objective would be to preserve flexible exchange rates while domestic monetary growth would be constrained by a gold reserve requirement. However, it is not obvious how this arrangement would function. Under such an arrangement, a shift from a foreign currency into gold by an American investor would impose the whole burden of adjustment on the foreign currency-dollar exchange rate, since the dollar price of gold would not change. Exchange rates would tend to become more variable than they are under the present floating system. In addition, the reduction in the gold reserve would lead to a contraction of the monetary base. The rest of the world, of course, could peg to the dollar, as some of them do now. Could foreign countries obtain gold from or sell gold to the United States? How would such gold transactions affect domestic monetary policy?

6. Advocates of the gold standard claim that its restoration -- and possibly even the announcement of a decision to restore it -- will immediately reduce both the inflation rate and the level of interest rates, and will eliminate inflationary expectations. No transitional costs are mentioned. However, contracts in the credit and labor markets and final products markets reflect the existing inflationary cost and price structure. Advocates do not explain how the adjustment of the existing cost and price structure to the new noninflationary gold standard can be achieved without bankruptcy and loss of employment. It is this

consideration that motivates some who argue that it is premature to advocate a return to the gold standard before price stability has been attained by controlling monetary growth.

B. An international gold standard with a fixed price of gold

Under this proposal, the United States would maintain fixed exchange rates with other countries based on the fixed price of gold it chose and the definition of the gold content of the dollar and other national money units. Such a standard could be achieved either by international agreement or by evolution -- the United States would be the first to reinstitute the fixed price of gold and other countries, persuaded by U.S. success in stabilizing the domestic price level, would follow suit. International payments imbalances would be settled by gold flows or by flows of dollars or dollar assets convertible into gold at the fixed price. The monetary base and the money supply would vary with gold flows.

Problems in implementing an international gold standard in some respects are similar to those presented in implementing a domestic gold standard.

1. The key problem again is choosing the right price for gold at which to fix the exchange rate. In 1925, Great Britain returned to the gold standard at an unrealistically high gold price for the pound. In 1947, it repeated that mistake. In the first instance, it struggled for six years in a vain attempt to deflate the economy to make the gold price viable in the face of gold outflows. The pound was then freed to float. In the second instance, it gave up the attempt after two years and devalued. In 1928, France returned to the gold standard at an unrealistically low price for the franc. Gold inflows into France (and U.S. sterilization of its

gold inflow) destabilized the system.

2. The preceding examples indicate a problem that could arise were the United States to choose the gold price for the dollar independent of other countries' decisions. As in the British-French exchange rate decisions in the 1920s, unilateral actions could produce unsustainable relationships.

3. A multilateral return to the gold standard would require international agreement and amendment of the IMF rules. Yet there is no evidence that our trading partners have an interest in reinstating the gold standard. The views they have expressed, in fact, are negative with respect to the desirability or feasibility of a return to the gold standard.

4. All the problems associated with fixed exchange rates would have to be dealt with again. Is the United States, with a relatively closed economy, well advised to seek fixed exchange rates that throw the whole burden for adjusting international payments imbalances on the domestic money supply, incomes, and employment?

5. Assuming that the profits of gold revaluation could be sterilized in the United States, would that also be true of the rest of the world? If not, would the United States not be open to the transmission of inflation from foreign economies that chose to monetize the profits of revaluation?

6. Restoring an international gold standard implies restoring convertibility to dollar claims of foreign governments and central banks, not to mention private institutions and individuals. Such claims could be exercised and affect the monetary base with no relation to ongoing balance of payments flows.

C. Increased use of gold in Federal Reserve and Treasury operations, but not a return to a gold standard

Two types of changes in gold arrangements, considered in this group, both based on a variable price of gold, differ in their advocates' view of discretionary Federal Reserve policymaking. One type would reduce or even eliminate the Federal Reserve's discretion. The other type would enhance it. Neither type involves a return to a gold standard but both, if adopted, would make a significant change in current gold arrangements.

Three proposals of the first type differ broadly in content. One proposal is that gold coins, by weight, be issued and allowed to circulate as a parallel currency, their price to be determined by market forces. Some proponents have urged Treasury issue of official coins; others have promoted issues by private mints. Both favor exemption of the coins from capital gains and sales taxes. The underlying conception is that paper money holders could exercise the option to convert paper to gold coins and the pace of such conversions would be a signal to the Federal Reserve whether its policies were overly expansionary.

Another proposal advocates Treasury issue of gold-backed notes or bonds. The argument supporting the proposal is that the more stable purchasing power of gold than of the dollar will permit the market yield on such gold-backed issues to be lower than current market yields on dollar notes or bonds. Thus using these instruments will reduce the national debt and the incentive for monetary and fiscal authorities to use the inflation tax as a way of servicing the national debt. Proposals differ with respect to the redemption of the issue: some specify redemption at the price of gold at date of issue, others at date of redemption, others offer the option of redemption in dollars rather than gold. Some propose a coupon of 2 or 3 percent; others a coupon of 8 percent -- still much lower than

current yields on Treasury dollar issues.

The third proposal to limit Federal Reserve discretion is based on a different approach. It would limit the growth in M1 by tying the maximum allowable growth of currency in every 12-month period to the increase in that period in the value of the Federal Reserve's gold certificates. The value of the gold certificates depends on the official price of gold which, as noted in section I above, was last set in 1973 at \$42.22 an ounce. The proposal is that the official price would be increased percentagewise in each period by enough (1) to offset a predetermined increase in the certificate requirement, starting at 9 percent in 1981, plus (2) the maximum desired growth in M1 beginning in 1982, plus (3) an adjustment for changes in the ratio of checking deposits to currency. The proposal recommends a 33 percent yearly increase in the certificate requirement as from 9 to 12 percent, 12 to 16 percent, and so on. The purpose of the increase is to raise the official price of gold to the market price in about eight years. Capital gains accruing to the Treasury from raising the price would be used to retire Federal Reserve holdings of Treasury debt, leaving the monetary base unchanged by the action. Gold coins would not be convertible at fixed prices, but they could circulate as coins by weight, as under the preceding proposal.

A proposal of the second type would allow the price of gold to fluctuate with market forces but would establish upper and lower bounds to the ratio between the value of the gold stock and the monetary base (the gold cover). If the gold reserve ratio reached either the upper or lower limit, the Federal Reserve would intervene by conducting open market operations either in gold or government securities. The proposal assumes

flexible foreign exchange rates for the dollar.

1.- In evaluating the proposals, it can be said that if problems arise in connection with issue of gold coins by weight, they will be marginal to the question of monetary control. Whether gold coins are successfully used as money will depend on the market test. Given the past variability in the price of gold, the short-run variability of goods prices in terms of gold coins may be much larger than that of goods prices in terms of dollars. That would make the use of gold coins as a medium of exchange unlikely.

No limit is proposed on Treasury issue of the gold coins. The possibility therefore exists that the Treasury's gold stock might be transferred to the public in this manner, should their unlimited use spread. It is assumed that only U.S. citizens will acquire the coins in small quantities. But what if foreign sources ordered large quantities on a given day? Such an order, placed in the gold market, would raise the price. That consequence will not follow at the Treasury sales window.

If no quantity limit is imposed on the issue of gold coins by the Treasury, setting a seignorage fee well in excess of the cost of minting would impose a price limit. One suggestion along these lines is that the Treasury issue a one-ounce \$1000 legal tender coin. If as many as 25 million of such coins were issued, they would earn the Treasury approximately \$15 billion in seignorage at current market prices. The payment in dollars for the coins would reduce the money supply, provided the Treasury refrained from adding the seignorage to its general funds. It is alleged that a \$1000 one-ounce coin would fluctuate less in value than a bullion coin would. Holders could use it in transactions or hold it to diversify their portfolios.

The exemption of gold coins from capital gains and sales taxes, when other forms of gold holding were not so favored, would encourage a shift in composition of portfolios that included gold to coins.

2. The problem raised by an issue of gold backed-notes or bonds is that it offers gold holders an opportunity to acquire gold without incurring the cost of storage and insurance. A Treasury issue of gold-backed bonds, paying a low rate of interest, would permit speculation on gold, with the additional inducement of the coupon. The purchase of such an instrument would indicate an expectation that the market price of gold would rise. The Treasury would be betting against the market, with the possibility of Treasury losses.

3. The proposal to link the growth of currency issues to the predetermined change per year in the price of gold is a monetary growth rule in disguise. The same objective could be accomplished without the use of gold.

4. The problem with the proposal to use the price of gold as an indicator for discretionary monetary policy is that it fails to distinguish the source of movements in the price of gold. Movements in the price of gold might reflect market reactions to monetary policy, but equally they might reflect changing real forces in the gold market.

An argument made for open market operations in gold is that it offers the central bank the option of using an instrument that will have its initial impact on the price of gold rather than on interest rates. Thus, if the central bank were concerned about producing a change in interest rates, yet desired to affect the growth rate of the money supply, it could conduct appropriate gold operations, in preference to operations in

government securities. The duration of the differential effect on interest rates of gold rather than government securities operations is not addressed by the argument. It seems dubious that the differential effect, assuming it can be detected, will persist for longer than the briefest interval -- say, a day. Gold operations, like government securities operations, affect bank reserves. It is the banks' response to the change in their reserves that affects credit markets.

In addition, open market operations in gold would not be as effective as those in government securities because gold is not as close a substitute as government securities are for financial assets financing real production and consumption.

D. Increased use of gold in international monetary arrangements, but not a return to a gold standard

The proposals considered here do not involve a major change in existing monetary arrangements.

One proposal advocates revaluing the monetary gold stock at prices closer to current market prices and using the gold stock for intervention purposes in the foreign exchange market and to settle international payments imbalances.

A proposal of a different sort would request the IMF to return to member countries their gold contributions.

A problem arises in connection with the proposal to restore the usability of U.S. gold reserves for transactions with foreign central banks by negotiating an agreement with them to accept gold at a market-related price. If the gold price continued to vary as it has in the past, the

value of international reserves would be subject to changes in speculative sentiment in the gold market. If the price of gold stabilized, central banks might sell off gold with a consequent decline in reserves. If gold became a liquid asset, that would increase world liquidity and heighten inflation pressure. The proposal to use gold as an intervention vehicle endorses intervention when such a policy may not be in the national interest. If intervention is a policy of choice, gold is clearly not needed to achieve it.

To request restitution of IMF gold to member countries in proportion to their quotas would require an international agreement and an amendment to IMF regulations. If gold is regarded as a valuable asset to be held against emergencies by the United States, the same consideration should apply to the international gold reserve.

E. Decreased role of gold as a potential policy instrument

There is essentially only one proposal in this group, namely, the Treasury should sell the gold stock over a period of years and use the proceeds either to retire Federal debt, reduce taxes, or finance the current deficit. A program of auction sales could be directed to such a goal, but it would require avoidance of speculation on the timing and magnitude of gold sales. However, such sales would reduce insurance against contingencies. It would spell a reduction in a safeguard against massive overissue of the money supply, or against wartime needs for gold. In addition, the possibility of a future return to a gold standard probably has psychological value to some citizens.

III. The Gold Market

This section is organized as follows:

- A. Introduction
- B. History of the gold market before 1968
- C. Changes in location and operation of gold markets since 1968
- D. Components of the demand for gold
- E. Components of the supply of gold
- F. Approaches to determination of equilibrium price of gold
- G. Record of gold production in past centuries and its relation to trend movements in commodity prices
- H. Summary

A. Introduction

Gold is a commodity. Like any other commodity, it will be produced only if the price at which it can be sold will exceed the costs of production, including the return on capital investment, wage costs, and prices of other inputs. Until 1968, the world gold trade was essentially controlled by the central banks of the leading industrial countries. They were the source of gold at fixed prices for industrial users. That changed when the private gold bullion market was established in 1968 as the so-called second tier to the official market. Since 1971, the central banks of the leading industrial countries have virtually withdrawn from the world gold market. There is now a private market in which producers, holders, and users participate. New gold output now moves through the private gold market directly to industrial buyers or nongovernment holders.

In this market, the price of gold fluctuates, like the prices of other world-traded commodities, to balance supply and demand. In the short run,

the price may be volatile. In the long run, the price must be high enough to yield a return to producers that is competitive with other uses of their capital. Similarly, no commercial user will buy gold unless its price is competitive with that of substitutes and the product in which it is embedded can be sold at a profit. Investors will choose to hold gold only if it will yield a return measured in purchasing power that is equal if not greater than the expected real return on other investment opportunities.

B. History of the gold market before 1968

Over the centuries, gold mined in many countries around the world has found its way to central distribution points where users have been able to acquire it. The distribution centers until 1968 were dominated by governments but private sector demand was accommodated in those markets from new output, recycled material, or from existing stocks.

In the United States, the main government institutions dealing with the gold market have been the mints and assay offices, which purchased newly mined gold, assayed it and imports of foreign gold, and sold gold on demand to domestic or foreign buyers before 1933. In addition, private gold refiners and processors converted gold material into gold bars or processed gold for the trade. There were no direct dealings between gold producers and industrial users. Before 1933, commercial banks and Federal Reserve Banks were also gold buyers and sellers. Thereafter, purchase of gold was confined to government agencies. Beginning in 1933, the Treasury Department or refiners licensed by it sold bar gold or refined gold to licensed users, who were prohibited from engaging in international gold transactions.

The world's principal gold market before World War I was in London.¹ Four bullion brokers were in business there long before the adoption of the international gold standard. One of them, N.M. Rothschild and Son, were agents for many South African gold mines, having earlier financed the industry. Once a week the brokers met to fix the price of gold and silver. The adoption of the gold standard restricted their business, since the Bank of England's (more or less) fixed buying and selling prices of gold limited fluctuations in the price. Nevertheless, the brokers continued to "fix" the price and arrange the matching of bids and offers. A fifth bullion broker began operations in 1853.

During World War I, there was no international gold market. European continental gold, Australian gold, United States gold were all embargoed. All gold from the Union of South Africa had to be sold to the Bank of England at the statutory price. Purchasers of gold did not have access to the world's supplies but were limited to supplies available in their own countries.

From 1919 until Britain's return to the gold standard in 1925, the brokers once more resumed the distribution of newly mined gold. During this period, licenses were required for the export from London of newly produced South African gold, and South African gold was sold to the highest bidder through London agents. The demand was channeled through bids the bullion brokers made on behalf of clients, with no upper limit to the price until April 1925.

In 1925, South African gold shipments to London were temporarily suspended when the mines began to bring their output to the Pretoria mint for coinage, a more profitable course for them than sending it to London.

To allow the London bullion market to function as the distributor of South African gold throughout the world, the South African Reserve Bank undertook to buy gold from the producers and sell it in London through N.M. Rothschild as their agents. The Reserve Bank thus became the principal buyer of all gold produced in South Africa.

The relative importance of the London bullion market in the world distribution of gold declined in the interwar period. Before World War I, the gold was distributed to new and rapidly developing countries because of their regular borrowings in London. After the war, the burden of satisfying international demands for gold was shared with the London bullion market by the American banking system. From the time Britain left gold in 1931 until World War II, the bullion brokers operated as they had from 1919 to 1925. World War II closed the London gold market again.

After the war, South African and other Commonwealth gold producers began selling gold on other free markets, notably in Zurich, either for dollars or transferable sterling, and at premium prices in excess of the \$35 per ounce price of gold that the Bretton Woods Conference had adopted as the par value. Other centers thus gained business mainly of private transactors at London's expense. The Bank of England argued that opening the London gold market would secure a larger share of new gold for central banks. Accordingly, the London gold market was reopened in 1954. By 1956, 85 per cent of the new gold coming on the gold market was handled there.

The London market was the only two-way free market for gold of any size in the world economy, serving as a market not only for suppliers but for users as well. This distinguished it from markets elsewhere, such as Hong Kong, Macao, Beirut, Bombay, where local demands for gold predominated.

The market in Paris, in contrast to London, was a monopoly of the Banque de France, which sold gold when it was profitable to do so. France prohibits the import and export of gold by its inhabitants, so the market is local.

Rivaling London were the markets in Switzerland (Geneva and principally Zurich). Since the Swiss constitution required the central bank to maintain a certain level of gold reserves, the central bank therefore tended to be a buyer rather than a market manager like the Bank of England or the Banque de France. In addition, commercial banks and Swiss nationals also hold gold in their portfolios. Swiss laws permitted foreigners to trade freely and openly in gold without fear of disclosure. Zurich was largely a secondary market trading private customers' gold. What the Swiss market lacked was a major international foreign currency market comparable to London's. The relevance of the exchange market to the gold market was that arbitrage between the gold and foreign exchange market was thereby encouraged.

The preeminent role of the London gold market until 1968 was further confirmed by the Gold Pool arrangement instituted in 1961, for which the Bank of England acted as manager of an international buffer stock to stabilize prices in the London market. With prices stabilized there, it was unnecessary to intervene in other gold markets.

C. Changes in location and operation of gold markets since 1968

After March 17, 1968, when the governments that had constituted the London Gold Pool agreed to terminate all gold dealings with the private market either as buyer or seller, the U.S. Treasury amended existing gold regulations to permit domestic producers to sell and export gold freely to

foreign buyers as well as to authorized domestic users. Authorized domestic users were permitted to import gold or purchase it from domestic producers within the limits of their licenses. Private traders in gold could apply for licenses to acquire gold in any market for sale to U.S. industrial users, but all transactions with foreign monetary authorities were prohibited.²

With the demise of the Gold Pool, the London gold market remained closed from March 18 until April 1 "in deference to the strongly held views of some signatories of the Washington agreement [to establish the two-tier market] that the inauguration of the two-tier gold system would otherwise be prejudiced."³ Until March 17, South African gold had been sold in London directly to the Bank of England or through the London bullion brokers under the Bank's supervision. During the two weeks that the London gold market was closed, three Swiss banks formed a pool to buy from the South African Reserve Bank and sell all South African gold output at negotiated prices. Title to the gold was transferred to the Swiss banks but delivery of the gold continued to be made in London. Zurich thus became a primary market.

On April 1, 1968, the London gold market was reopened. Two fixings daily at 10:30 a.m. and 3 p.m. (instead of a morning fixing only) were instituted and spot prices were fixed in U.S. dollars instead of sterling as before. In 1972, the South Africans resumed sales of part of their gold output to London dealers, dividing it between the Swiss pool banks and the London dealers. (The sale of South African krugerrands is conducted in a market separate from the bullion market.) Soviet gold is usually sold in the Zurich market through the local Soviet bank.

Other gold markets that were once prominent, like Beirut, have declined and been supplanted by new markets (Bahrein and Dubai) in the Persian Gulf. The Middle East obtains some of its gold in Zurich in addition to the Persian Gulf sources. Hong Kong and Singapore are the significant centers for gold purchases in the Far East.

The gold markets so far discussed have been spot markets where transfers of physical gold have taken place. New types of gold markets have recently emerged, in which trading in futures of gold prices proceeds much as futures trading in other commodities.

Initially established in Winnipeg in 1972, the spectacular growth in gold futures contracts developed when such trading was approved on U.S. commodity exchanges in 1974 by the Commodity Futures Trading Commission. From 7,000 contracts in 1974, the number grew to 11 million in 1980. Of the five commodity exchanges, the New York Commodity Futures Exchange (COMEX) and the International Monetary Market (IMM) are the industry leaders. The main explanation for the success of the futures market is that gold futures contracts provide a hedge against price risk for producers and industrial users.

A movement toward a world market for trading futures is under way, to provide a 24-hour-a-day spot and futures gold price reading. The London gold futures market opened in September 1981 as a result of an agreement between the London Metal Exchange and the London Gold Market. Futures trading in Singapore and Hong Kong dates from 1980. A market in futures is also open in Sydney, Australia. However, the volume in New York and Chicago far surpasses that in other locations. An international continuous market is envisaged, since trading hours in New York and Chicago are

midnight hours in Hong Kong and Singapore, while London's business day is about to end before trading begins in North America.

Another likely development in 1982 is a gold futures option, to be listed on the New York Commodity Exchange. Futures are contracts for delivery of a commodity at a specified time, price and place. Options confer the right, but not the obligation, to buy or sell commodities or commodity futures or other instruments. Since April 1981, The European Gold Options Clearing Corporation of Amsterdam has operated the European Options Exchange which lists gold options. The Montreal Stock Exchange is slated to establish a joint gold options market with the European Exchange in February 1982.

D. Components of the demand for gold

1a. Three Categories of Demand

Historically, the demand for gold may be classified in three broad categories: (1) the nonmonetary demand for industrial fabrication; (2) the monetary demand for reserves by commercial or central banks and, when coin circulation was legal, for coin by the private sector; (3) investment demand by the private sector.

Industrial demand for gold for fabrication comprehends a variety of uses. The principal one through the ages has been the manufacture of jewelry. Of long-standing also has been the use of gold in dentistry. The decorative arts also have a long history of the application of gold in techniques that were known to ancient civilizations. Gold leaf, laminated gold, gilding, gold plating and vermeil have made use of gold. The current industrial uses of gold include electronics, nitric acid production, rayon

and synthetic thread production, window glass and solar and fuel cells using gold, alloys for brazing and soldering, catalysts, television selector production, and medical use (gold therapy of rheumatoid arthritis). Two other uses of gold -- in medals, medallions, and facsimiles of official, i.e., fake, coins, as well as official coins -- are sometimes included in industrial demand and sometimes in investment demand. Investment demand is estimated as the residual obtained by subtracting total enumerated consumption from total supply.

One problem with the classification scheme is that jewelry is included in industrial demand, yet for many holders, especially those in developing countries, jewelry represents an investment demand. Even if impeccable data on the components of the demand for gold were available and, as will presently be shown, that is not the case, the mixed industrial-investment characteristic of the jewelry component complicates the interpretation of the quantitative importance of the determinants of industrial demand for gold.

A special feature of the gold market is that there is a vast stock of gold from past production, currently estimated to total 2.8 billion ounces. The above-ground stocks of gold have accumulated over the centuries since gold is virtually indestructible. Of these stocks, the larger fraction is held by governments as the monetary gold stock. The balance is held by commercial and industrial users and by investors. In the main, transfers from existing investment stocks to industrial users have been limited. Recycled scrap gold and the annual flow of gold output to the market tend to be the main sources to satisfy the demand of industrial users.

1b. Demand for Gold Statistics, by Categories

The reported statistics for each of the three categories of demand for gold are estimates. Even for the second category, for which records of the banks and the mints exist, the sources of the statistics are not in full agreement. For the first category of industrial demand, the degree of estimation is greater and, in any one source, coverage may vary from year to year. Again, the estimates shown in different sources are not in full agreement. Given the margin of error associated with the estimates of the first two categories, the residual investment demand obviously cannot be estimated with any greater accuracy.

2a. Estimates of World Demand for Gold, by Categories

One estimate over extended periods from 1835 to 1952 allocates the distribution of gold output among monetary demand, the industrial arts, and absorption by India, China, and Egypt. The percentages are as follows:⁴

Period	Monetary	Industrial	Eastern Absorption
1835-1889	50	35	15
1890-1929	58	24	18
1930-1952	90	11	-1

The significance of the separate classification of absorption of gold by India and, of lesser significance, Egypt and China, was that the Indian masses invested their accumulated savings by purchasing precious metals, usually in fabricated form. When the price of gold rose after 1933, they sold off their gold. Indian bullion dealers melted their clients' gold trinkets, and sent them to the Mint in Bombay to be refined, assayed and molded into bars, which were exported. Silver then replaced gold in Eastern absorption.

Beginning in 1893, the Director of the U.S. Bureau of the Mint

presented annual estimates of world consumption of gold in the arts and industries. These estimates were obtained by correspondence with the leading countries of the world, and initially showed consumption of gold in British India separately. The estimates are clearly incomplete for the world.

The League of Nations gave annual estimates from 1915 of the change in central bank reserves (omitting 1918-22, when Russia's reserve was not reported) and industrial consumption, annually, 1922-38. For 1931-38, the amounts of gold released by the East are given. During the 1920s, the monetary demand averaged twice the industrial demand (with the exception of 1925) and during the 1930s, industrial demand dwindled and monetary demand absorbed nearly all annual output plus the release of Eastern gold.⁵ Since 1950, more reliable estimates have become available. Only in 1954-55 and 1957-58, did the gold purchases by official Western monetary authorities top one-half of the annual supply of gold. In the 1960s, in 3 years, there were no official purchases, with a low of under 7 percent of total supply and a high of 42 percent. In only 2 years of the 1970s were there any official purchases, ranging only from 10 to under 15 percent of the total supply. The world monetary gold stock peaked at about 1.2 billion ounces in the 1960s, falling to about 900 million ounces in 1980 as monetary authorities reduced official reserves.

Industrial including jewelry demand for gold, which had been negligible until the 1950s, then rose progressively as the real price declined. By the late 1960s, industrial demand equaled total gold output.

Industrial absorbed 92 percent of the supply in 1971 -- the peak year for industrial demand since 1950 -- and fell as low as 38 percent in one

year only -- 1974. In 9 years, industrial demand accounted for 40 and less than 50 percent of the annual supply; in 7 years, for 50 and less than 60 percent; in 6 years for 60 and less than 70 percent; in 4 years for 70 and less than 80 percent; in 3 years for 80 and less than 90 percent.

Coin, medallion, and net private bullion purchases first became significant as a percent of total supply in 1967-68, then dwindled in 1969-72. Since then, they have ranged from 20 to 62 percent of annual total gold supply.

2b. Estimates of Demand for Gold in the United States, by Categories

The Director of the Bureau of the Mint gave annual estimates in dollar amounts of the absorption of gold by industrial users beginning in 1880 through 1967; since then, the estimates are in troy ounces. We give the series in troy ounces throughout in the Statistical Compendium. We express the annual industrial consumption and the change in the U.S. monetary gold stock (gold and bullion held by the Treasury and commercial banks and the public before 1914 through 1933; thereafter, held also by the Federal Reserve Banks until 1933), each as a percent of U.S. annual gold production.

3. Determinants of World Demand for Gold: Industrial Demand

Table 4-1 shows the most recent annual estimates of the components of world gold demand from 1950 to 1980, in millions of troy ounces. Before the price of gold in the private gold market was freed to deviate from the official price in 1968, estimates of the breakdown of industrial and jewelry demand are not available: only a combined aggregate estimate exists. The table otherwise shows only net purchases in each category listed. Blanks in a column indicate that there were net sales in those

Components of Annual World Gold Demand, 1950-1980
(million of fine troy ounces)

Year	Source of Demand	Industrial Demand			Jewelry Demand		Jewelry and Industrial Demand (1)+(2)+(3)+(4)+(5)	Coin and Medal-lions ^a (7)	Net Private Bullion Purchases (8)	Net Purchases by		Total Demand (6)+(7)+(8)+(9)+(10)+(11)
		Elec-tronics (1)	Dentistry (2)	Other (3)	Developed Countries (4)	Developing Countries (5)				Centrally Planned Economies (9)	Official Western Agencies (10)	
1950							12.0		3.1		9.2	24.3
1951							13.0		3.2		7.5	23.7
1952							13.0		4.7		6.5	24.2
1953							12.5		1.0		12.9	26.4
1954							13.0				19.1	32.1
1955							13.5				19.0	32.5
1956							15.0		3.2		13.9	32.1
1957							17.0				19.7	36.7
1958							19.0				19.4	38.4
1959							22.0				21.5	43.5
1960							25.0		5.8		8.4	39.2
1961							28.0				17.2	45.2
1962							30.0		2.5		10.5	43.0
1963							32.5				23.4	55.9
1964							34.5				20.2	54.7
1965							36.0		10.1		6.3	52.4
1966							37.5		2.6	2.1		42.2
1967							38.0		46.9	0.1		85.0
1968		2.6	2.0	1.9	29.3		35.8	3.5	19.8	0.9		60.0
1969		3.2	1.9	2.0	29.2		36.3	2.3		0.5	2.9	42.0
1970		3.0	1.9	2.0	34.2		41.1	3.2		0.1	7.6	52.0
1971		2.8	2.0	2.2	17.8	16.3	41.3	3.4				44.7
1972		3.4	2.1	2.4	22.6	9.4	39.9	3.3			4.9	48.1
1973		4.1	2.1	2.3	13.8	2.9	25.2	2.4	17.2			44.8
1974		3.0	1.8	2.2	8.9		15.9	9.5	16.8			42.2
1975		2.2	2.0	1.9	10.2	6.6	22.9	8.7	4.4			36.0
1976		2.4	2.5	2.1	15.1	14.9	37.0	7.5	1.9			46.4
1977		2.5	2.6	2.1	17.4	14.9	39.5	6.2	6.9			52.6
1978		2.8	2.9	2.5	19.0	13.3	40.5	10.8	4.8			56.1
1979		3.0	2.8	2.4	17.7	6.0	31.9	10.4	12.8			55.1
1980		2.6	2.0	2.1	8.7		15.4	6.2	9.4		7.4	38.4

Source, by Column; A. J. Aron & Company, Symposium on Gold (October 1981)
 B. J. Aron & Company, Gold Statistics and Analysis (November 1978)
 C. Consolidated Gold Fields Limited, Gold 1979 (June 1979)

(1)-(5), 1968-70: Source C, p. 16 (converted from metric tons to fine ounces).
 1971-72: Source B, p. 36.
 1973-80: Source A, p. 13.

(6)-(10): Source A, p.13.

Note: Arithmetic errors in Source A, p.13, have been corrected.

years that added to supply and hence are included in the companion table for the annual world gold supply.

What factors determine the world demand for gold? First, we consider industrial demand, and then asset demand. Of two possible approaches, one analyzes the disaggregated data, the other, the aggregate data. The disaggregated approach estimates demand functions for each of the components of industrial demand and, in addition, breaks it down by regions of the world. The advantage of this approach is that it can isolate the possible influence of changes in the composition of demand which may affect aggregate demand. One example is the growth of gold use in electronics and the relative decline in its use in dentistry. Another is the higher income elasticity in growing countries than in mature countries. The chief disadvantage of the disaggregated approach is the existence of measurement problems with respect to some of the components.

The alternative approach, summing all possible industrial uses of gold, isolates the key economic determinants of the demand. These include the real price of gold (the market price deflated by a worldwide price index), the real price of close substitutes (for example, silver), and world real income. The effects of the real price of gold on the quantity demanded would be expected to be negative -- a higher real price would reduce the quantity demanded. The effect of the real price of close substitutes on the quantity of gold demanded would be expected to be positive -- a higher real price of a close substitute would increase the quantity of gold demanded; a lower real price of a close substitute would reduce the quantity of gold demanded. Likewise, world real income would be expected to exert a positive effect on the quantity of gold demanded.

An econometric estimate of aggregate world industrial demand for gold for 1950-80 reveals both real income and the real price of gold to be the key statistically significant determinants of demand, with signs in accordance with theoretical expectations (see Appendix Table A1, part 1). However, the real price of silver as a measure of close substitutes for gold was found to be statistically insignificant. We used U.S. real income as a proxy for world real income, in the absence of a world real income series before 1960. In the regressions, the income effect overpowers the price effect. Continued growth of real income at the rate of 3 to 4 percent per year would be associated, other things equal, with a 5 to 7 percent increase in the demand for gold for industrial purposes. In addition, a one percent rise in the real price of gold would lead to a three-quarters of 1 percent decline in the quantity demanded.

We also estimated aggregate world industrial demand for gold over the period 1969-80, using two measures of world real income, in addition to U.S. real income (see Appendix Table A1, part 2). The results, using all three measures of income, are similar. Both income and price elasticities are higher than over the longer period, suggesting that continued growth of real income at the rate of 3 to 4 percent per year would be associated, other things equal, with a 9 to 12 percent increase in the demand for gold for industrial purposes,⁶ while a one percent rise in the real price of gold would be fully offset by a corresponding decline in the quantity demanded.⁷ We caution again that the results may be contaminated by the presence of investment motives for absorbing gold in the data for industrial demand.

4. Determinants of World Demand for Gold: Asset Demand

Asset demand for gold by the private sector is motivated by regard for gold as a hedge against inflation and against political uncertainty. As a hedge against inflation, the rate of appreciation in the price of gold over the period for which it is held must be at least as great as the market rate of interest. If the market rate of interest rises, reflecting a rising real return on other assets, the demand for gold as an asset will decline. However, if the market rate of interest rises, reflecting expectations of higher inflation, the demand for gold will fall only to the extent that inflationary expectations are not fully incorporated in the nominal interest rate.

In the case of an increase in political uncertainty, other things equal, the demand for gold will rise.

The determinants of the world net asset demand for gold (private purchases less sales of gold)⁸ should depend positively upon the world's wealth or real income, negatively upon the real rate of interest, and positively on expectations of inflation. In regressions using annual data over the period 1969 to 1980, we found limited support in most cases for our theoretical specification. Only one regression confirmed expectations [Appendix Table A2, eq. (8)]. In that regression, the real rate of interest, measured by the Eurodollar rate minus the rate of change of the world consumer price index; the actual rate of inflation, based on the latter series; and world real income, all had the postulated signs and were statistically significant. Moreover, these variables explained over 80 percent of the variation in net asset demand. Other equations, also reported in Appendix Table A2, using other measures of the variables, were less successful.

A quarterly estimate of the asset demand from 1968 II through 1974 IV reported in the literature also was a plausible representation of the actual behavior of that series.⁹

E. Components of the Supply of Gold

1. Gold Production

Gold was mined in ancient times, but the earliest quantitative estimates available of gold output date from the discovery of America. Between 1493 and 1980, the estimated total of gold mined is 2.8 billion ounces, about two-thirds of which was mined in the past 50 years.

Between 1493 and 1848, the year of the California gold discoveries, total gold mined is estimated at less than 150 million ounces, of which the United States produced less than 2 million ounces. Most of the gold produced by that date was held by individuals as jewelry or coins, not in government monetary reserves. The world monetary gold stock in 1848 was about 50 million ounces.

From 1850 to 1933, total gold mined is estimated at 900 million ounces, of which the United States produced one-third. Most of this output was coined, 350 million ounces by Great Britain, 220 million ounces by the United States, 150 million ounces by the rest of the world, the total not necessarily in circulation. By 1933 the world monetary gold stock amounted to 580 million ounces, having increased at a considerably faster rate than total gold mined.

Except in the decades of the 1870s, 1880s, and 1920s, until 1933 the official price of gold was generally at a premium over production costs, so encouraging an expansion of gold output and discouraging commercial use.

The increase in the official price of gold in 1934 accounted for the huge rise in gold output thereafter until the 1960s, when the decline in the real price of gold eroded the incentive to increase output.

World gold production peaked in 1970. Since then it has been declining in response to the earlier decline in the real price of gold and the depletion of existing reserves.

2. Changes in the Major Producing Areas

Fewer than a dozen countries have accounted for the bulk of the gold mined in each century for which estimates exist. South America's share of total world gold output rose from 36 percent in the 16th century to a peak of 80 percent in the 18th century, and then rapidly dwindled in the 19th and 20th centuries; currently it amounts to about 2 percent of total output. The output of European gold mines declined from 21 percent in the 16th century to 6 percent in the first decade of the 19th century. A major discovery in Russia in 1814 increased the share of Europe's output by 1840 to the level in the 16th century, following which the relative importance of the continent's contribution declined to 1 percent by 1925. Russian output since then has accounted for a rise in the continent's contribution to 21 percent in 1980. U.S. discoveries in 1848, and Australian discoveries in 1851 raised the combined shares of the two areas to 80 percent of total world output by 1855, with a gradual decline thereafter to 56 percent by 1895. A major discovery in Canada in 1896 restored the North American plus Australian share of the total to 58 percent in 1905. The decline in the following decades reduced the combined share to less than 10 percent in 1980. Gold output of South Africa made a significant contribution from the beginning of the 20th century, rising consistently

except in the decade of the 1930s until it accounted for two-thirds of total output by 1970. Since then it has declined to about 55 percent in 1980.

There are thus fluctuations not only in the average annual aggregate output of gold but also in the geographical sources of increments to the gold stock.

The current nine leading gold-producing countries accounting for 91.4 percent of total gold output in 1980, and their shares were as follows:

<u>Country</u>	<u>Share of Total Gold Output in 1980 (in percent)</u>
Republic of South Africa	55.6
U.S.S.R.	21.3
Canada	4.1
Brazil	2.8
U.S.A.	2.4
Philippines	1.8
Australia	1.4
Ghana	1.0
Zimbabwe	0.9

The Republic of South Africa and the U.S.S.R., the major gold producing countries, are regarded by some observers as politically unreliable sources of gold. Whatever the weight that should be attached to this view, these countries determine the quantity of gold to market annually independently of the decision of the quantity to mine, as will be indicated in the

section below on the supply of gold.

U.S. new gold output, which declined from 1.7 million ounces in 1970, to 0.95 million ounces in 1980, was supplemented in that year by private refiners' recovery of secondary gold from scrap, amounting to 2.2 million ounces, and by commercial imports, amounting to 4.5 million ounces.

3. World Gold Reserves

As with any exhaustible resource, the estimate of gold reserves is based on current economic minability. Other identified deposits that are known are not currently economic to mine. It is also always possible that undiscovered gold may remain to be found.

The best estimate of world gold reserves is that it approximates 1 billion ounces -- compared to 1.8 billion ounces that have been mined over the past 50 years. Half of the 1 billion ounces is in South Africa, half of the other half in the U.S.S.R. Other identified deposits total about 0.9 billion ounces. These estimates are subject to upward revision. It may be that the rise in the price of gold since 1973 has not yet been reflected in the calculation of demonstrated and inferred reserves, which depend on detailed information about hundreds of deposits.

Since South African reserves are so large a fraction of total world reserves, it is important to examine key aspects of the estimation of that country's reserves. In 1970, it was widely believed that its gold mining industry could not survive, given rising costs of production and a falling real price of gold. Since then, the increase in the price of gold led by 1980 to a ten-fold increase in capital spending on producing mines plus additional amounts for the development of new mines not yet in production. While milling capacity of the industry expanded over the decade, there was

no corresponding increase in the output of gold. In fact, output fell steadily from 32.1 million ounces to 21.7 million ounces. The reason is that the average grade of ore milled by gold mines fell from 13.3 grams per ton in 1970 to 7.3 grams per ton in 1980. There is no expectation that the level of production will rise in the 1980s, barring a dramatic change in the relationship between the price of gold and costs of production. The rise in costs has been associated with a substantial increase in the industry's wage bill and improvements in the living quarters for black workers, which are planned to continue. High capital costs also confront the industry. They deter expansion of existing mines mining lower grade ore, and also the reopening of mines that were uneconomic when the gold price was fixed.

Gold mining in South Africa is a labor-intensive industry. Mechanization of the goldfields is impractical because of the depth at which mining has to be carried out, the hardness of the rock that has to be excavated to develop access tunnels, the high temperatures of the rock, and the narrowness of the orebody. Most of the people employed are black migratory workers whose families remain in tribal homelands. Movement of blacks into skilled work is opposed by white trade union members, posing an obvious labor problem for the industry.

The calculation of South African ore reserves depends critically on the concept of pay limit, which is the minimum quantity of metal in a ton of rock sufficient to yield the revenue to cover costs of mining, processing, and marketing gold. The reserves usually include ore available for extraction within a year. All gold mines in South Africa lease mines from the State subject to the restriction that the company must mine to the

average value of its published ore reserves. When the price of gold was fixed, the pay limit rose as mining costs increased; since the 1970s, the pay limit has declined when the price of gold has risen and risen when it declined. In some mines, a relatively minor change in the pay limit can make significant tonnages of low grade ore payable or unpayable, with large effects on the total ore reserve. Whereas pay limits formerly were reviewed once or twice a year, the practice now is to review them monthly. The objective is to limit the number of places that have to be stopped before they have been worked out, so that grade control can be achieved as working places are exhausted.

Projections of South African gold output, assuming a current gold price of \$305 and rising to \$407 by 1984, then rising at the same level as costs until 2000, or alternatively, a current price of \$450, rising to \$554 in 1984 and then remaining constant in real terms until 2000, are broadly similar: annual gold output totals 22.5 million ounces until 1987 and then gradually declines to 11.25 million ounces by 2000.

One other determinant of South African gold output must be mentioned. A state assistance program was introduced in 1968 to subsidize gold mines that were no longer profitable, thus enabling marginal mines to remain in operation. If the price of gold should decline, the amount of state assistance, which was negligible in 1980, could again rise. The State's motive in providing assistance was to obtain foreign exchange from sales of gold output and incidentally avoiding capital costs of re-opening mines at a later date when their operation might become economic.

While information relating to South African gold mining is very fully reported, figures neither for annual output nor for reserves of gold are

published by the U.S.S.R. Publication of statistics of gold output was prohibited by the Soviet government in 1926, data about geological deposits were discontinued in 1934, and the gold reserves of the State Bank have been secret since 1935. A series of Western estimates, using a variety of methodologies, have been subject to substantial revision from time to time.

An early estimate was based on an announcement in a Five Year Plan that prospecting had raised known deposits from 79.4 million ounces in 1926 to 111.5 million ounces in 1934. The Gold Mining Administration Director at that time predicted that Soviet gold production would surpass that of the South African Rand and lead the world. The prediction was empty but encouraged Western estimates of Soviet output of 18.3 million ounces and monetary reserves ranging as large as 272 million ounces.

A 1960 revision by the CIA of those estimates reduced the estimate of annual output to a range of 4.3 million ounces to 4.9 million ounces and of monetary reserves to 56 million ounces. Western observers thereafter used the CIA figures which were reputedly based on a Party document a Soviet defector provided.

Consolidated Gold Fields Ltd. made an effort subsequently to produce its own estimates, initially by translating and collating Soviet press reports and technical papers available in the West. The Soviet sources gave percentage estimates of the extent to which targets had been met in individual gold producing areas and the rate of growth of output and additions to ore reserves. No targets or production figures were given by the sources. In 1974, the company adopted a different approach to estimating Soviet gold production, based on information about the type and size of equipment and processes that were being used in mining and

extracting gold. Relying on comparison with similar workings elsewhere, the gold content of the material treated was estimated from the nature of each operation and the numbers, types and sizes of machines being used. Between the first and second study, substantial upward revision of the estimates resulted from a re-examination of publications on reef mining. More attention had been placed on alluvial mining in the company's first study because the Soviet press and radio publicized developments there rather than in reef mining, which presumably contributed more to aggregate gold output than previously had been assumed. The second approach yielded an overestimate because it assumed that Soviet production was as efficient as in the West.

Currently, Consolidated Gold has under way a third study using satellite photographs in addition to the earlier techniques. At this stage, the company estimates that Soviet annual output is in the range of 9 to 11 million ounces. A revision of estimated Soviet output has raised the annual figures the company reports. The estimate it gives for 1980 is 10 million ounces. The company assumes that sales to the West by the communist bloc of 12.9 to 13.2 million ounces per year in 1976-78 required drawing down stocks. Communist bloc sales include, in addition to sales by the Soviet, smaller amounts by Communist China and North Korea. The decline in sales to the West by the bloc in 1978-80 was attributed to the availability of an alternative source of foreign exchange -- oil and gas sales -- which reduced the need to market gold abroad. Increased gold sales since reported reflect an increase in demand for foreign exchange the alternative sources have not supplied.

What is currently known or assumed to be known about world gold

reserves therefore suggests that gold output until the end of the century will at best offset some portion of the declining trend that existed from 1970 to 1975.

4. Components of the World Gold Supply

The supply of gold does not depend solely on new gold mined, although for the world as a whole the production of market economies is the principal component. Most gold producers in this sector sell all their annual output. The exceptions include South Africa and Canada. South Africa was reluctant to sell its output in 1976-77 when the price of gold declined, although it had a large balance of payments deficit. Instead of selling gold, it arranged a swap of 8.0 million ounces of gold for foreign currency, with the option to repurchase the gold at the swap price plus interest. In 1979, it exercised the option and bought 3.9 million ounces of the swap total, selling most of it at the current high price, and adding the remainder to its gold reserves. In other years since 1960, South African gold sales have been more or less than current output, depending on the market price of gold, the price of diamonds and other minerals the country exports, and its balance of payments.

Canada has sold gold on occasion in excess of current output to reduce the size of its gold reserves. Other countries from time to time require their domestic producers to allocate part or all of their output to the central bank. On the whole, however, gold production in market economies flows to the supply markets of the world.

The supply components other than the output of market economies are intermittent, fluctuating from year to year when present, and absent altogether in other years. These components include:

- a) the flow from centrally planned economies
- b) sales by official monetary institutions
- c) sales of jewelry hoards by developing countries
- d) sales of private bullion hoards

a) As noted, the flow of gold to the market from the communist bloc has fluctuated with its need for foreign exchange. There were no sales in the five years 1966-70, when the bloc was a net purchaser. Sales have ranged from 13 million ounces per year in 1976-78, as noted above, to 1.7 million ounces in 1971. In 1980, the bloc sold 2.9 million ounces and an estimated 6 million ounces in 1981.

b) Net sales by official institutions were limited to the years 1966-68, 1971, 1973-79. They ranged from 0.2 million ounces in 1973 to 45.1 million ounces in 1967.

c) Jewelry sales by developing countries amounted to 1.7 million ounces in 1974 and 4.2 million ounces in 1980. In other years, developing countries absorbed gold jewelry.

d) Disharding of private bullion holdings contributed to the supply of gold only in the years 1969-72, when it ranged from 0.1 million ounces to 11.0 million ounces.

Table 4-2 lists the components of the world gold supply annually from 1950 to 1980 and compares the total with the corresponding annual world output. The movements in supply are more erratic than those in gold output.

5. Determinants of Market Economy Gold Production

An econometric estimate of the determinants of the gold production of market economies for 1950-80 was obtained by a regression on current and

Table 4-2

Annual World Gold Supply and Gold Output, 1950-1980
(millions of fine troy ounces)

Source of Supply Year	Production in Market Economies (1)	Flow from Centrally Planned Economies (2)	Net Official Sales (3)	Jewelry Sales by Developing Countries (4)	Disharding of Private Bullion Holdings (5)	Annual Total Supply (1)+(2)+(3) +(4)+(5) (6)	Annual World Output (7)
1950	24.3					24.3	28.3
1951	23.7					23.7	27.4
1952	24.2					24.2	27.9
1953	24.2	2.2				26.4	27.8
1954	25.5	2.2			4.4	32.1	29.1
1955	26.8	2.2			3.5	32.5	30.4
1956	27.8	4.3				32.1	31.5
1957	29.0	7.4			0.3	36.7	32.6
1958	29.9	6.3			2.2	38.4	33.7
1959	32.1	8.6			2.8	43.5	36.2
1960	33.5	5.7				39.2	37.8
1961	34.7	8.6			1.9	45.2	39.3
1962	37.3	5.7				43.0	41.7
1963	38.6	15.7			1.6	55.9	43.3
1964	40.0	12.9			1.8	54.7	44.9
1965	41.0	11.4				52.4	46.5
1966	41.0		1.2			42.2	46.9
1967	39.9		45.1			85.0	46.0
1968	40.1		19.9			60.0	46.5
1969	40.3				1.7	42.0	47.1
1970	40.9				11.1	52.0	48.1
1971	39.7	1.7	3.1		0.2	44.7	47.1
1972	37.8	6.8			3.5	48.1	45.9
1973	35.8	8.8	0.2			44.8	44.1
1974	32.8	7.1	0.6	1.7		42.2	41.5
1975	30.9	4.8	0.3			36.0	39.5
1976	31.3	13.2	1.9			46.4	40.6
1977	31.1	12.9	8.6			52.6	40.7
1978	31.3	13.2	11.6			56.1	41.2
1979	31.2	6.4	17.5			55.1	42.8
1980	30.7	2.9		4.8		38.4	42.6

Source, by Column: J. Aron & Company, Symposium on Gold (October 1981)

(1), (2) and (5): p.13.

lagged values of gold and a time trend as a proxy for technical progress.¹⁰ As expected, the real price affects market economy production negatively and with a one-year lag.¹¹ The time trend, however, was not significant, although the constant term was highly significant. In addition, regressions covering the period 1969-80 gave results similar to those for the longer period.¹² All the results are reported in Appendix Table A3.

F. Determining the equilibrium price of gold

Except during periods when the U.S. did not adhere to the gold standard, the price of gold has been fixed by the government. The most recent such period may be dated from 1968, when the two-tier gold market came into being, with the termination of the London Gold Pool's efforts to restrain the price of gold in private transactions. Since then, it may be said that the price of gold at any moment is determined by the interaction of total demand for and supply of gold.

Because gold is held for asset as well as industrial purposes, and because the existing stock of gold is very large relative to changes in the stock, it is important to distinguish between the stock and the flow markets for gold. It has been generally agreed that, in the case of the gold market, in the short run at least, conditions in the stock (asset) market dominate those in the flow market. Thus the determinants of net asset demand would be the key factors affecting the price in the absence of any significant sales from official sources or from the communist bloc. Indeed, evidence by Peter Abken,¹³ the International Gold Corporation, and Otani and Lipschitz suggests that monthly and quarterly variations in the

price of gold are largely explained by conditions in the asset market. However, in the long run, conditions in the flow market are the key determinants of the price. In addition to the determinants of industrial demand, the key consideration of the flow supply side is market production of gold. Evidence that it responds negatively to variations in the real price of gold has just been discussed. This relationship reflects the special conditions in the South African gold industry. However, international production has expanded in the past as a result of technological innovation and new discoveries.

If the equations for the industrial demand for gold and for the gold output of market economies are solved for the real price of gold, this yields a reduced-form equation,¹⁴ where the real price of gold is determined by the exogenous (independent) variables of the flow demand and supply equations: world real income, the time trend as a proxy for technical advance, the real price of silver, and the real price of gold lagged by one year. Such a reduced-form equation explains up to 93 percent of the annual variation in the real price of gold. Adding a market interest rate and, in turn, the annual percentage change in the price level or, lagged money growth as a proxy for price expectations, to account for factors affecting the net asset demand for gold, adds 4 percent to the explanation of price variations¹⁵ (see Appendix Table A-4) .¹⁶

One way to arrive at an equilibrium price of gold is to follow the approach of Robert Aliber.¹⁷ He takes the price of \$35 per ounce in 1961, a year when the United States had virtual price stability, as an initial equilibrium price. Assuming no other factors affected the real price, the nominal price of gold should have increased to the same extent as the

increase in the U.S. price level since 1961. The U.S. CPI tripled between 1961 and 1980, hence the nominal price of gold should have been \$105 in 1980. Using the world CPI change, the price should have been \$155.¹⁸

However, as the discussion above indicates, other factors would have affected the real price of gold in addition to the increase in the general price level. If world real income elasticity of demand for gold is taken to be 1.85 (based on the results for 1950-80 reported in Appendix Table A1), and the increase in world income approximated 83 percent (based on an index of world real GNP), the demand for gold would have increased by 154 percent over the period 1961-80.¹⁹ Over the same period, the total world gold stock increased by 35 percent.²⁰ Thus the excess demand for gold amounted to about 120 percent. If we take the price elasticity of demand for gold to be -1 ²¹, and price elasticity of supply to be close to zero,²² then the real price would have increased (other things equal) by about 120 percent since 1961. On this calculation, the equilibrium price of gold in 1980 would have been between \$230 and \$340.²³ This exercise assumes that factors affecting the net asset demand for gold are transitory, and would vanish once price stability is restored.

Assume that at a price per ounce of gold, within the calculated range of \$230 to \$340, the gold standard were restored. In the current free market, a monetary demand essentially does not exist. The price calculation reported here was based on equating the nonmonetary demand for and the supply of gold. Under a gold standard, the government sets the price and must satisfy all demands for gold at that price. Under a reinstated gold standard, a monetary demand for gold would recur. Only after the monetary demand for gold had been accommodated, would the

nonmonetary demand for gold be satisfied. None of the demand relationships in the foregoing econometric exercise would persist. The supply equation, however, would presumably be unaffected by a return to the gold standard. The question then resolves itself into the adequacy of the supply relative to the putative prospective monetary and nonmonetary demand for gold.²⁴

G. Record of gold production in past centuries and its relation to trend movements in commodity prices

The rate of growth of world gold output over the centuries has waxed and waned. Chart 4-1 plots world yearly output of gold from 1800 to 1980. Table 4-3 compares average annual rates of growth of world output of gold (in millions of fine ounces), for subperiods since 1849, with corresponding average annual rates of change of available measures of the U.S. price level.

The table leaves no doubt that gold production has not increased at a constant annual rate from subperiod to subperiod. Averaging over periods of high and low growth rates of gold production obviously yields a smoother picture. Similarly, averaging over periods of a falling price level matching low growth rates of gold production and periods of a rising price level matching periods of high rates of gold production yields a smoother picture of price change. But for contemporaries each period was distinct and exacted first the costs of deflation and then the costs of inflation. Advocates of a return to a gold standard appeal to a record of stable growth rates of gold output as the assurance of a stable price level under the gold standard. The data refute the claim.

Three subperiods since 1934 invite comment. Annual rates of growth of

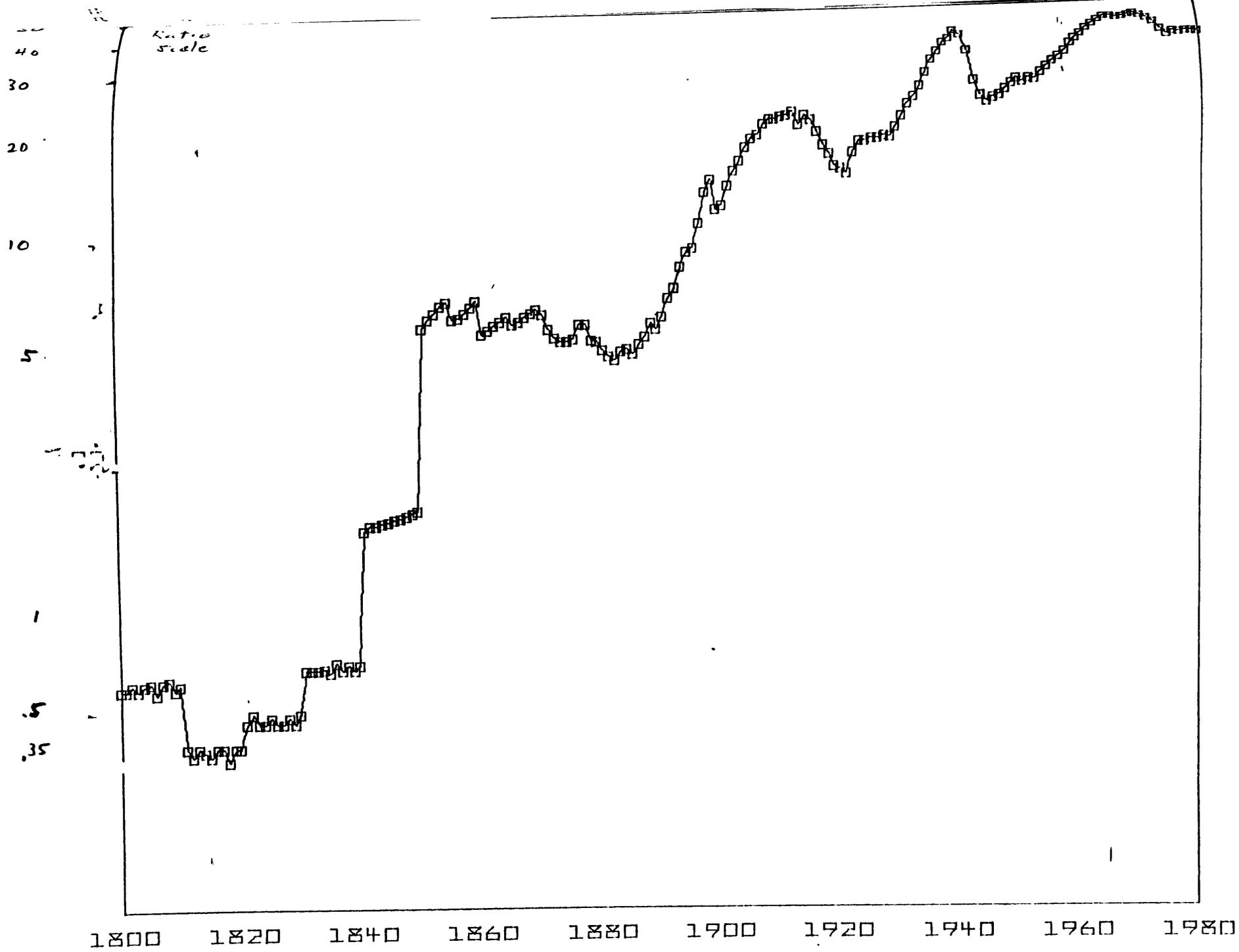


Table 4-3

Comparison of Average Annual Rates of Change of World Gold Output and of Various Measures of the U.S. Price Level, by Subperiods, 1849-1980

<u>World Gold Output</u>		<u>U.S. Price Level</u>	
Period	Average Annual Rates of Change (in percent)	Period	Average Annual Rates of Change (in percent)
1849-1870	6.2	1849-1870	2.37 Wholesale Prices
1871-1889	-0.3	1869-1896	-2.11 (NNP price deflator)
1890-1913	6.0	1896-1913	1.97 "
1920-1933	3.4	1920-1933	-3.90 "
1934-1940	7.0	1934-1940	0.66 "
1950-1968	2.7	1950-1968	2.64 (GNP price deflator)
1969-1980	-1.6	1969-1980	6.50 "

Source: For gold output, see the Statistical Compendium, Table 1, below.

For wholesale prices, 1849-70, see U.S. bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 1, Series F-2, pp. 202-203.

For the deflator implicit in net national product, 1869-1940, see M. Friedman and A.J. Schwartz, Monetary Trends in the United States and United Kingdom, 1867-1975, Ch. 4, appendix of basic annual data (in press).

For the deflator implicit in GNP, 1950-80, see Economic Report of the President, Transmitted to the Congress February 1982, Table B-3, p. 236.

Note: Rates of change assume continuous compounding, that is, they are the difference between the natural logarithms of the variable at the terminal and initial dates divided by the number of years separating those dates.

gold output more than doubled in the closing years of the interwar period, 1934-40. -The doubling was a response to the sharp increase in the profitability of gold mining that the U.S. increase in the official price from \$20.67 to \$35 an ounce produced. At first glance, the 0.66 average annual rate of increase in the U.S. price level from 1934 to 1940 may not appear to reflect the surge in gold output. However, a comparison of the change in the average annual rate of increase in the U.S. price level from the 1920-33 to the 1934-40 subperiod (+4.6 percent per year) with the corresponding change in the rate of change of gold output (+3.6 percent per year) shows a close relationship between the two variables. After 1950, the rate of change of the U.S. price level no longer tracks the rate of change of gold output. Post-World War II inflation experience was fueled by means other than rising gold output, which accounted for inflations before 1914 that were clearly less virulent than the postwar episode.

H. Summary

The rate of growth of gold output is not constant over time. After World War II, output grew at about 3 percent per year until 1970, and has since declined at about 1.5 percent per year. The most important gold producer among market economies is South Africa. Factors that would operate to continue the downward trend in South African output include a government mandated shift to lower-grade ores when the average gold price rises, inflation effects on labor and capital costs, shortages of skilled labor and labor unrest, as well as the high costs associated with deep mining. Offsetting these factors are the possibility of discovery of new gold fields and uranium revenues, since the mineral is found in one-sixth

of South African gold mines. Gold output in the United States and Canada, including byproduct gold production mainly from copper mining, has also displayed a negative postwar trend, although a rise in gold prices has encouraged reopening of mines and exploration. Brazil has become a recent gold producer, although its output is not consequential. Among Communist countries, the U.S.S.R. is the leader, estimated to produce about one-fifth of the world's output, although its sales are not geared to production but to balance of payments needs. Until the end of this century, little increase in annual world gold production is in prospect.

Advocates of a return to the gold standard tend to dismiss concern with the prospective rate of growth of world gold output. Yet the amount of gold available for annual additions to the stock of monetary gold is a crucial factor in determining the trend of the price level under a gold standard. If the annual rate at which the monetary gold stock increases is below the rate of population growth and real income growth, the consequence is a declining trend in the price level.

This conclusion follows from extensive studies of the per capita demand for money that have shown it to be determined by per capita real income and an interest rate representing the yield on an asset alternative to holding money. If the supply of monetary reserves will not match the growth in demand for money, the price level will fall. It was not by coincidence that the negative rate of gold output growth from 1871 to 1889 was associated with a declining price level in the United States and worldwide until 1896. The decline in the price level was the consequence of the decline in the rate of gold output growth concomitant with a rising world demand for gold. Similarly, the decline in the price level during the

1920s was a consequence of the fall in the rate of gold output during that decade. In each case, the declining rate of gold output was a response to an earlier decline in the real price of gold.

A declining trend in prices may seem a desirable development after decades of a rising price level. However, such a change would impose two kinds of costs of adjustment upon the economy: (1) transition costs in moving from an inflationary to a deflationary environment; (2) continuing costs of a deflation, assuming continuance of a gold standard. The costs might be regarded as tolerable if they affected all markets proportionally, so borrowers and lenders, workers and employers, retired and active labor force participants, urban and rural families, were all equally burdened. No more than the costs of inflation, however, will the costs of deflation be so distributed. We believe that we should not knowingly adopt a standard that, given the current prospects of gold output, produces such a result. To improve the condition of the economy, we should rather seek a stable solution for the price level.

Notes to Chapter 4

1. W.A. Brown, Jr., The International Gold Standard Reinterpreted, NBER, 1940, 2 vols., pp. 228-34, 627-37.
2. Annual Report of the Secretary of the Treasury 1968, pp. 467-70.
3. Bank of England, Quarterly Bulletin, June 1968, p. 109.
4. W.J. Bisschau, "Some Notes on Gold Production and Stocks," in National Industrial Conference Board Special Studies no. 43, Shall We Return to a Gold Standard - Now? 1954, p. 163.
5. International Currency Experience: Lessons of the Inter-War Period, League of Nations, 1944, p. 233. Where they overlap, the League of Nations annual estimates do not agree with the annual estimates in the source cited in note 4 for the period 1930-1952.

In many years, the sum of the change in central bank reserves and industrial consumption does not equal the gold supply. In other years, the sum greatly exceeds the reported output or supply.

6. U.S. real income grew at an average annual rate of 2.74 percent from 1969 to 1980; real income of 7 industrial countries increased at an average annual rate of 3.22 percent, and world real income by an average rate of 3.76 percent. For sources, see Table A1, part 2.
7. A recent study using annual data over the period 1970-80 reported the real price elasticity as -1.2 and the real income elasticity as 2.9 (International Gold Corporation Limited, A Gold Pricing Model (August 1981: p. 5.) The results are similar to those reported in our Appendix Table A2.

A quarterly study of the period 1968-74 reported a price elasticity of -0.7 and an income elasticity of 0.6 (L. Lipschitz and I.

Otani, "A Simple Model of the Private Gold Market, 1968-74: An Exploratory Econometric Exercise," IMF Staff Papers 24 (March 1977: 36-63).

8. We added the constant \$20 billion to the net asset demand series to allow us to make the log transformation. Net asset demand is defined as Table 4-1, col. 8, minus Table 4-2, col. 5, for a definition excluding coins and medallions. Including coins and medallions, the definition is the sum of Table 4-1, cols. 7 and 8, minus Table 4-2, col. 5. Regression results including coins and medallions were superior to those excluding them.
9. Lipschitz and Otani (note 7, above) found hoarding demand for gold to be significant functions of Eurodollar and Euromark interest rates, expected inflation, and wealth over the period 1968-74.
10. The results were similar for the period 1951-80, using the world CPI as the deflator (available only since 1950); for 1950-80, we used the U.S. wholesale price index as the deflator. See Appendix Table A3.
11. The real price lagged two and three years did not improve the results nor did omitting the time trend (Appendix Table A3).
12. The estimate of price elasticity of gold output reported by Lipschitz and Otani for the period 1968-74 is -0.11, similar to our result.
13. "The Economics of Gold Price Movements," Federal Reserve Bank of Richmond, Economic Review (March/April 1980): 3-13.
14. An equation system is said to be complete when it has as many endogenous (dependent) variables as equations (in our example, two: one for the demand for gold, the other for the supply of gold), and when it can be solved for these variables. The solution is called the reduced form

of the system. The reduced form is convenient for calculating the effect of a change in exogenous (independent) variables on an endogenous variable.

15. In the equations in Appendix Table A4, we deflate the prices of gold and silver by the U.S. and world GPI. To be consistent, we use the two series as measures of price change. Results were similar in regressions using the U.S. wholesale price index as the measure of annual price change.
16. The study by the International Gold Corporation (see note 7, above), using monthly data, explains most of the variation in the price of gold with measures of the real rate of interest, lagged world money growth, and a measure of world political tension. However, the reported results do not include Durbin-Watson statistics, suggesting that they may be marred by autocorrelation, as are many of those reported here.
17. See his statement before the Commission, November 12, 1981. For a more comprehensive treatment of his approach, see his paper, "Inflationary Expectations and the Price of Gold," presented to the World Conference on Gold, Rome, February 5, 1982.
18. The world CPI, available in IMF, IFS Yearbook, increased 4.4 times over 1961-80.
19. If we use the income elasticities of the past decade, reported in Appendix Table A1, part 2, and those reported in the International Gold Corporation study (an average of 3.22 in Table A1, part 2, and 2.9 in the latter study), the income elasticity would be closer to 3. Such an estimate would raise the increase in gold demand to 213 percent.
20. Based on U.S. Bureau of the Mines data.

21. Based on the results shown in the Appendix tables and other sources cited.
22. The assumption here is that the price elasticity in the gold output equations in Appendix Table A3 can be taken as a proxy for the price elasticity of the short-run supply curve.
23. Using the income elasticity from the recent period would raise the price to \$330 and \$490. The higher income elasticity estimates, however, must be viewed with caution. Some of the net asset demand for gold that has emerged since 1969 may be captured by the income effect.
24. On the importance of knowing not only the parameters of the nonmonetary demand for gold but also of the money-market monetary demand for gold, in evaluating the outcome of a return to the gold standard, see Robert P. Flood and Peter M. Garber, "Gold Monetization and Gold Discipline," Board of Governors of the Federal Reserve System, International Finance Discussion Papers, Number 190 (September 1981).

For an analysis of the same issues from an alternative approach, see William Fellner, "Gold and the Uneasy Case for Responsibly Managed Fiat Money," in Essays in Contemporary Economic Problems: Demand, Productivity, and Population, 1981-1982 edition, ed. William Fellner, American Enterprise Institute, pp. 97-121.

Appendix Table A1, Part 1

Annual Industrial Demand for Gold, 1950-1980

$$\log Q_{ind}^D = B_0 + B_1 \log \left(\frac{P_g}{P} \right) + B_2 \log \frac{P_s}{P} + B_3 \log y + e$$

Coefficients of Independent Variables

(t-values in parentheses)

Equation No. (Technique)	Constant (B ₀)	Real Price of Gold (B ₁)		Real Price of Silver (B ₂)		Real Income (B ₃)		SEE	DW	ρ
		WPI	CPI	WPI	CPI	U.S.	R ²			
1. (C-0)	-22.478 (-6.187)*	-0.779 (-1.863)* 5.075		-0.273 (-7.950)* (-1.563)		2.317 (7.452)*	.945	.101	1.714	.715
2. (C-0)	-11.307 (-3.464)*		-0.714 (-3.605)		-0.122 (-0.570)	1.399 (5.639)*	.895	.140	1.937	.563

*Statistically significant at the 5 percent level.

Technique: C-0 = Cochrane Orcutt

Sources: Industrial demand ($\log Q_{ind}^D$): Table 4-1.

Price of gold ($\log P_g$): London Price and J. Aron.

Price of silver ($\log P_s$): London Price and J. Aron.

Wholesale price index (WPI): U.S. Bureau of Labor Statistics.

Consumer price index (CPI): World price index (IMF).

Real income (U.S.): Department of Commerce, Bureau of Economic Analysis.

Note: See Chapter 1, note 4, for definitions of statistical measures.

$$\text{Annual Industrial Demand for Gold, 1969-1980}$$

$$\log Q_{\text{ind}}^D = B_0 + B_1 \log \left(\frac{P_g}{P} \right) + B_2 \log \frac{P_s}{P} + B_3 \log y + e$$

Coefficients of Independent Variables
(t-values in parentheses)

Equation No. (Technique)	Constant (B ₀)	Real Price of Gold (B ₁)		Real Price of Silver (B ₂)		Real Income (B ₃)			\bar{R}^2	SEE	DW	ρ
		WPI	CPI	WPI	CPI	7 Major Industrial Countries	World	U.S.				
1. (OLS)	-11.319 (-4.095)*	-1.495 (-5.876)*		0.228 (1.013)		4.518 (6.261)			.941	.125	2.32	
2. (OLS)	-8.268 (-3.243)*	-1.462 (-5.294)*		0.216 (0.880)			3.855 (5.625)*		.862	.136	2.09	
3. (C-0)	-41.636 (-8.655)*	-1.053 (-7.266)*		-0.009 (-0.557)				3.895 (9.927)*	.929	.101	2.56	-0.39
4. (OLS)	-7.857 (-3.634)*		-1.301 (-5.534)*		0.086 (0.415)	3.590 (6.350)*			.906	.113	2.23	
5. (OLS)	-5.510 (-2.775)*		-1.268 (-5.030)*		0.066 (0.296)		3.074 (5.783)*		.890	.122	2.05	
6. (C-0)	-32.494 (-8.593)*		-0.969 (-7.478)*		-0.125 (-0.859)			3.142 (10.199)*	.941	.093	2.63	-0.42

* Statistically significant at the 5 percent level.

Technique: OLS = Ordinary least squares

C-0 = Cochrane Orcutt

Sources: Industrial demand ($\log Q_{\text{ind}}^D$): Table 4-1.

Price of gold ($\log P_g$): London Price and J. Aron.

Price of silver ($\log P_s$): London Price and J. Aron.

Wholesale price index (WPI): U.S. Bureau of Labor Statistics.

Consumer price index (CPI): World price index (IMF).

Real income (7 major industrial countries): Citibank, based on GDP of U.S.A., Canada, U.K., Japan, France, Germany, Italy.

Real income (world): IMF.

Real income (U.S.): Department of Commerce, Bureau of Economic Analysis.

Appendix Table A2

Annual Net Asset Demand for Gold, 1969-1980

$$\log NA^D = B_0 + B_1 \log R + B_2 \log (R - \hat{P}) + B_3 \log (R - \hat{P}^*) + B_4 \hat{P} + B_5 \hat{P}^* + B_6 \hat{M}_{t-1} \log y + e$$

Coefficients of Independent Variables
(t-values in parentheses)

Equation No. (Technique)	Constant (B ₀)	Nominal Interest Rate (B ₁)		Real Interest Rate (B ₂)		Expected Real Interest Rate (B ₃)		Actual Rate of Price Change (B ₄)		Expected Rate of Price Change (B ₅)		Lagged Monetary Growth Rate (B ₆)	Industrial Real Income (B ₇)	R ²	SEE	DW	p
		90-day Treasury bill rate	Euro-dollar rate	90-day Treasury bill rate	Euro-dollar rate	90-day Treasury bill rate	Euro-dollar rate	U.S. CPI	World CPI	U.S. CPI	World CPI						
1. (OLS)	-5.249 (-1.102)	-0.281 (-0.465)						0.0496 (0.666)					1.893 (1.810)	.372	.302	1.89	
2. (OLS)	-2.577 (-0.545)		-0.025 (-0.085)						0.053 (1.336)				1.183 (1.103)	.463	.279	2.18	
3. (OLS)	-5.523 (-1.468)	-0.088 (-0.262)								-0.052 (1.428)			1.871 (2.129)*	.472	.277	1.73	
4. (OLS)	-2.906 (-0.978)		0.127 (0.568)								0.085 (2.845)*		1.115 (1.595)	.674	.218	2.37	
5. (OLS)	-6.652 (-1.606)	-0.082 (-0.165)										7.450 (0.372)	2.097 (2.103)*	.349	.307	1.82	
6. (OLS)	-6.623 (-1.542)		0.023 (0.049)					0.190 (0.427)				4.394 (0.206)	2.086 (2.043)*	.347	.308	1.75	
7. (OLS)	-5.568 (-1.180)			0.055 (0.297)									1.898 (1.792)*	.363	.304	1.87	
8. (C-O)	-1.372 (-0.654)				-0.190 (-3.488)*				0.061 (3.478)*				0.892 (1.866)*	.804	.171	1.90	-0.5
9. (OLS)	-7.404 (-1.411)					-0.127 (-0.564)				0.032 (0.719)			2.274 (1.919)*	.488	.223	1.79	
10. (OLS)	-2.434 (-0.689)						0.063 (0.396)				0.098 (2.157)*		1.041 (1.246)	.667	.220	2.41	
11. (OLS)	-8.955 (-2.572)					-0.377 (-2.039)*						20.278 (1.464)	2.407 (2.939)*	.570	.250	2.37	
12. (OLS)	-5.442 (-1.599)							-0.271 (2.00)*				17.099 (1.294)	1.697 (2.047)*	.561	.251	2.30	

Notes to Table A2

* Statistically significant at the 5 percent level.

Technique: OLS = Ordinary least square
C-O = Cochrane Orcutt

Expected U.S. annual rate of price change (\hat{P}) was obtained by regressing the rate of change in U.S. CPI on a measure of the long-term rate of change of money -- a 3-year moving average of M1B -- lagged one year (\hat{M}_{t-1}):

$$1. \hat{P} = -0.125 + 3.30 \hat{M}_{t-1}$$

(-4.2)* (1.94)*

$$\begin{aligned} \overline{R^2} &= .875 \\ \text{SEE} &= .010 \\ \text{D.W.} &= 1.80 \\ \rho &= 0.363 \end{aligned}$$

Expected world annual rate of price change was obtained by regressing the rate of change in world CPI on the U.S. money variable, as in equation (1) above:

$$2. \hat{P} = 0.043 + 2.483 \hat{M}_{t-1}$$

(-0.81) (3.17)*

$$\begin{aligned} \overline{R^2} &= .755 \\ \text{SEE} &= .016 \\ \text{D.W.} &= 1.68 \\ \rho &= 0.677 \end{aligned}$$

For industrial countries covered by real income measure, see Table A1, part

Appendix Table A3, Part 1

Annual Market Economy Gold Production, 1950-1980

$$\log Q^S = B_0 + B_1 \log \left(\frac{P}{g} \right) (t) + B_2 \log \left(\frac{P}{g} \right) t-1 + B_3 \text{Time} + e$$

Equation No. (Technique)	Constant (B ₀)	Coefficients of Independent Variables (t values in parentheses)		(B ₃) Time	R ²	SEE	DW	ρ
		Real price of Gold (B ₁)	Real Price of Gold Lagged (B ₂)					
		U.S. WPI	U.S. WPI					
1. (C-0)	4.285 (13.498)*	-0.074 (-1.886)**		-0.011 (-0.934)	.964	.033	0.65	0.936
2. (C-0)	4.406 (14.004)*		-0.104 (-2.369)*	-0.012 (-1.024)	.967	.032	0.841	0.937
3. (C-0)	4.427 (12.853)*	-0.036 (-0.794)	-0.081 (-1.569)	-0.010 (-0.740)	.966	.032	0.760	0.940
4. (C-0)	4.038 (23.077)*	-0.094 (-2.880)*			.964	.033	0.645	0.933
5. (C-0)	4.148 (22.013)*		-0.126 (-3.258)*		.966	.032	0.856	0.934
6. (C-0)	4.203 (21.719)*	-0.047 (-1.129)	-0.089 (-1.750)**		.967	.032	0.741	0.935

Sources: Market economy gold production (Q^S): Table 4-2, col. 1.

See notes to Appendix Table A1 for sources of other data.

* Statistically significant at 5 percent level.

** Statistically significant at 10 percent level.

Appendix Table A3, Part 2

Annual Market Economy Gold Production, 1951-1980

$$\log Q^S = B_0 + B_1 \log \left(\frac{P}{g} \right) (t) + B_2 \log \left(\frac{P}{g} \right) t-1 + B_3 \text{Time} + e$$

Equation No. (Technique)	Constant (B ₀)	Coefficients of Independent Variables (t values in parentheses)						R ²	SEE	DW	ρ
		Real Price of Gold (B ₁)		Real Price of Gold Lagged (B ₂)		(B ₃)					
		U.S. WPI	World CPI	U.S. WPI	World CPI						
1. (C-0)	4.359 (18.407)*	-0.077 (-2.193)*					-0.014 (-1.466)	.968	.030	0.711	0.923
1a. (C-0)	4.325 (17.630)*		-0.036 (-1.200)				-0.020 (-2.149)*	.964	.032	0.853	0.923
2. (C-0)	4.425 (19.139)*						-0.101 (-2.504)*	.969	.029	0.962	0.923
2a. (C-0)	4.446 (17.849)*						-0.064 (-2.046)*	.967	.030	0.908	0.930
3. (C-0)	4.392 (19.529)*	-0.045 (-1.095)					-0.073 (-1.541)	.965	.029	0.827	0.921
3a. (C-0)	4.417 (18.162)*		-0.022 (-0.750)				-0.059 (-1.779)**	.967	.030	0.876	0.924
4. (C-0)	4.064 (27.558)*	-0.104 (-3.503)*						.966	.030	0.658	0.909
4a. (C-0)	3.874 (27.394)		-0.065 (-2.252)*					.959	.034	0.843	0.907
5. (C-0)	4.152 (25.414)*						-0.131 (-3.669)*	.967	.030	0.964	0.911
5a. (C-0)	3.959 (27.365)*						-0.090 (-2.824)	.962	.032	0.871	0.909
6. (C-0)	4.208 (25.767)*	-0.058 (-1.514)					-0.083 (-1.777)**	.969	.029	0.790	0.911
6a. (C-0)	4.068 (25.207)*		-0.092 (-1.419)				-0.072 (-2.133)*	.963	.032	0.828	0.909

Source: See notes to Appendix Table A3, Part 1.

Appendix Table A3, Part 3

Annual Market Economy Gold Production, 1969-1980

$$\log Q^S = B_0 + B_1 \log \left(\frac{P_g}{P} \right) (t) + B_2 \log \left(\frac{P_g}{P} \right) t-1 + B_3 \text{ Time} + e$$

Equation No. (Technique)	Constant (B ₀)	Coefficients of Independent Variables (t values in parentheses)				Time	R ²	SEE	DW	ρ
		Real Price of Gold (B ₁)		Real Price of Gold Lagged (B ₂)						
		U.S. WPI	World CPI	U.S. WPI	World CPI					
1. (C-0)	3.565 (11.374)*	-0.064 (-1.517)			0.010 (0.388)	.920	.031	0.706	0.872	
1a. (C-0)	3.568 (11.511)*		-0.062 (-1.609)		0.088 (0.329)	.922	.031	0.718	0.872	
2. (C-0)	3.787 (15.548)*			-0.094 (-2.227)*	0.004 (0.209)	.937	.028	1.520	0.850	
2a. (C-0)	3.786 (16.240)*			-0.088 (-2.288)*	0.0001 (0.020)	.938	.028	1.510	0.847	
3. (C-0)	3.730 (13.083)*	-0.030 (-0.675)		-0.078 (-1.578)	0.014 (0.569)	.932	.029	1.240	0.866	
3a. (C-0)	3.722 (13.279)*		-0.030 (-0.718)	-0.071 (-1.580)	0.010 (0.438)	.934	.028	1.240	0.866	
4. (C-0)	3.683 (19.812)*	-0.057 (01.707)				.927	.030	0.704	0.852	
4a. (C-0)	3.666 (21.077)*		-0.057 (-1.788)			.930	.029	0.714	0.857	
5. (C-0)	3.836 (21.701)*			-0.093 (-2.572)*		.943	.076	1.480	0.835	
5a. (C-0)	3.791 (23.368)*			-0.088 (-2.606)*		.945	.026	1.510	0.845	
6. (C-0)	3.729 (13.083)*	-0.030 (-0.675)		-0.078 (-1.578)	0.014 (0.569)	.932	.029	1.240	0.865	
6a. (C-0)	3.837 (21.441)*		-0.024 (-0.658)	-0.071 (-1.663)		.941	.027	1.210	0.841	

Source: See notes to Appendix Table A3, Part 1.

Appendix Table 4-A4

Reduced-Form Equations for the Annual Real Price of Gold, 1969-1980

$$\log \frac{P_G}{P} = B_0 + B_1 \log y + B_2 \frac{P_a}{P} + B_3 \log \frac{P_G}{P} (t-1) + B_4 \text{Time} + B_5 \log R + B_6 \hat{P} + B_7 \hat{M} + e$$

Coefficients of Independent Variable
(t-values in parentheses)

Equation No. (Technique)	Constant (B ₀)	Industrial Countries Real Income (B ₁)	Real Price of Silver (B ₂)	Real Price of Gold lagged (B ₃)	Time (B ₄)	Nominal Interest Rate		Rate of Price Change		Long-term Money Growth Rate (B ₇)	R ²	SEE	DW	ρ
						90-Day Treasury Bill Rate (B ₅)	Euro- dollar rate	U.S. CPI (B ₆)	World CPI					
1. (C-0)	-5.881 (-0.445)	1.920 (0.640)	0.841 ^a (3.912)*		-0.026 (-0.234)						.930	.169	1.84	0.169
2. (C-0)	-7.480 (-0.578)	2.433 (0.832)	0.790 ^b (3.970)*		-0.046 (-0.440)						.902	.164	1.86	0.318
3. (C-0)	-32.428 (-2.244)	7.921 (2.415)*	0.700 ^a (3.573)*	0.512 ^a (1.848)	-0.262 (-2.052)**						.931	.167	-0.27 ^h	-0.180
4. (C-0)	-34.090 (-2.702)*	8.081 (2.924)*	0.630 ^b (3.555)*	0.481 ^b (2.100)**	-0.259 (-2.566)*						.914	.154	-0.29 ^h	-0.330
5. (C-0)	-43.501 (-6.194)*	10.550 (6.244)*	0.700 ^a (2.203)**	0.250 ^a (1.569)	-0.334 (-4.653)*	-0.864 (-3.339)*		11.365 (2.872)*			.974	.103	-2.33 ^h	-0.739
6. (C-0)	-23.211 (-1.410)	6.068 (1.683)	0.769 ^b (1.616)	-0.076 ^b (-0.185)	-0.184 (-1.306)		-0.215 (-0.569)		5.671 (1.299)		.920	.148	-2.68 ^h	-0.541
7. (C-0)	-40.024 (-4.494)*	9.334 (4.107)*	0.522 ^a (1.120)	0.531 ^a (2.828)*	-0.293 (-2.965)*	-0.384 (-1.169)				22.297 (2.088)**	.964	.122	-2.34	-0.652
8. (C-0)	-35.897 (-4.307)	8.415 (4.426)*	0.431 ^b (1.037)	0.403 ^b (1.941)**	-0.261 (-3.473)*		-0.328 (-1.209)			24.226 (2.368)**	.951	.116	-2.73	-0.667

^a Deflated by the U.S. consumer price index.^b Deflated by the world consumer price index.^h Durbin-Watson h statistic, a measure of autocorrelation in the presence of a lagged dependent variable. A value less than one indicates the presence of autocorrelation.

Source: See Appendix Table A1 to A-3.

* Statistically significant at the 5 percent level.

** Statistically significant at the 10 percent level.

Report of the Gold Commission
Introduction and Recommendations

Establishment of the Commission

We, the members of the Gold Commission, were appointed by Secretary of the Treasury Donald T. Regan on June 22, 1981, pursuant to section 10(b) of Public Law 96-389 (94 Stat. 1555), to "conduct a study to assess and make recommendations with regard to the policy of the U.S. Government concerning the role of gold in domestic and international monetary systems." The Commission was directed to transmit its report to Congress no later than October 7, 1981, 1 year after the date of enactment. Due to the change in administration and the delay in appointment of members, it was not until July 16, 1981, that we met for the first time. We were in general agreement that a satisfactory report could not be prepared by the October 7 date. Accordingly, we requested an extension of the Commission's life. Legislation to that end was introduced in the Congress and enacted as P.L. 97-47 on September 30, 1981. The date for the report of the Commission was thereby changed to March 31, 1982.

Commission Meetings

We held 10 meetings, at 2 of which we heard testimony concerning gold from 23 witnesses, representing a wide spectrum of views on the potential roles of gold. They commented on the use and effectiveness of gold in past domestic and international monetary systems, and offered varying proposals for a restored role for gold, or favored the continuation of the present system with no role for gold.

In addition to the hearings, the Treasury Department invited written

statements on the role of gold from organizations and individuals.

Summaries of the testimony we heard and of the statements submitted to us are reproduced in annex 1 to the Report.

Contents of the Report

The body of our Report reflects the range of issues we discussed during our deliberations.

Chapter 1 surveys economic developments of recent years that were the background to the establishment of the Gold Commission. A distinguishing feature of the period since the mid-1960's was rising and persistent inflation without precedent in peacetime in the United States. Public attention to the activities of the Commission reflects a desire for some institutional arrangements to ensure a reasonable approximation of price stability in an economy whose resources are relatively fully employed in a balanced and sustainable way. The chapter presents the factual record of the performance of the economy, and reviews explanations that have been offered to account for the lack of success of several attempts to curb inflation in the decade and a half from 1965.

Chapter 2 examines the historical evidence on the experience of the United States with gold. In 1834, though legally on a bimetallic standard, de facto the United States adopted a gold standard. The chapter deals with successive changes since then in the character of our country's monetary system, down to the most recent decade of inconvertible paper money, and attempts to account for the changes.

In Chapter 3, we explore the strengths and weaknesses of alternative monetary standards, including different versions of a gold standard, commodity standards other than gold, and the present inconvertible paper

system. International aspects of the alternative standards receive attention.

In Chapter 4, we review the current role of gold and consider possible changes. In relation to domestic monetary arrangements, the changes would affect the conduct of Treasury or Federal Reserve operations or both. Such changes, if adopted, would also affect private sector conduct. In relation to the international monetary system, the changes would affect foreign exchange rate arrangements, the settlement of the balance of payments, or the International Monetary Fund.

For each possible change in the current role of gold, we discuss the main elements of the change, transitional problems, if any, potential legal and international implications, and assess the advantages or disadvantages it presents.

Chapter 4 also brings together material on the historical market for gold that was dominated by central banks until 1968, changes in the location and operation of gold markets since then, the allocation of the stock of gold between monetary and nonmonetary uses, determinants of the demand for and supply of gold, and approaches to the determination of the equilibrium price of gold. In addition, the chapter provides a retrospective view on the record of gold production over past centuries and its relation to trend movements in commodity prices. A statistical compendium gives time series of world and U.S. production and stocks of gold, world and U.S. industrial use of gold, and the nominal and real price of gold.

Aims of the Gold Commission

Part of our mandate is to assess the role of gold in the domestic and

international monetary systems. Assessments differ among members of the Commission not only with respect to the costs and benefits in the past when our monetary system was linked to gold but also with respect to the prospective costs and benefits, were such a link restored. Given the size of the Commission that the Congress specified, and the diversity of our views, that result may not be surprising. We decided that the best service we could render the country would be to set forth in an objective way the complex issues involved and give a fair hearing to different points of view.

Another part of our mandate is to make recommendations. Though it became apparent to us during our deliberations that we would not be able to achieve a unanimous set of recommendations, on some issues, it was possible to form majorities. Even so, a majority vote in favor of a specific recommendation did not signify that all so voting had the same purposes and/or interpretations in mind. Moreover, if each of us had been reporting singly instead of as one of a body of colleagues, individual members would not necessarily have expressed themselves in precisely the way the recommendations are stated. Differences in wording, emphasis and perceptions would have been evident. In some instances our recommendations touch on technical matters, such as legal and tax considerations, that need to be studied more exhaustively than it has been possible for us to do. Such technical questions should be given attention in any Congressional hearings in connection with our recommendations.

Majority and Minority Recommendations

We report our recommendations on the following subjects:

1. The program of Treasury medallion sales

2. Treasury issue of gold bullion coins
3. Treasury issue of gold-backed notes or bonds
4. The gold stock owned by the United States
 - a. The public accounting for the gold stock
 - b. The relationship between gold certificates held as an asset of the Federal Reserve System and the gold held by the Treasury
 - c. The appropriate size of the gold stock
 - d. The price at which to value the gold stock
 - e. Managing the gold stock
5. Domestic monetary policy arrangements
6. International monetary policy arrangements

With respect to most of these subjects, we first present majority views and then the minority views, with some discussion of the opposing reasons that were expressed in our deliberations.

1. The program of Treasury medallion sales

In July 1980, the Treasury began the sale of half-ounce and one-ounce gold medallions in accordance with the American Arts Gold Medallion Act of November 10, 1978 (PL 95-630). The legislation provided that not less than 1 million ounces of gold be struck into medallions each year for a five-year period and sold to the public at a price covering all costs. A different American artist is commemorated on each of the two sizes of medallions. In 1980, Grant Wood was honored on the one-ounce and Marian Anderson on the one-half ounce medallion. In 1981, Mark Twain was honored on the one-ounce and Willa Cather on the one-half ounce medallion. Under the 1980 program covering the period July 15, 1980, through February 28, 1981, less than 300 thousand medallions of each size were sold, amounting

to 434 thousand gold ounces. Under the 1981 program from July 15, 1981, through February 1, 1982, about 60 thousand medallions of each size were sold, amounting to 88 thousand gold ounces.

The price of the medallions varies daily with the market price of their gold content, based on the settlement price at the end of the previous day for gold traded on the Commodity Exchange of New York, plus a surcharge in 1980 of \$12 and in 1981 of \$14 per ounce to cover the cost of production and marketing. The surcharge averaged about three percent of the underlying gold price.

The Bureau of the Mint sells the medallions directly to purchasers through mail orders placed at U.S. post offices. Delivery is made weeks later.

The Treasury Department is planning a simpler and wider distribution of the medallions to be introduced this year through a network of dealers. Although details are not yet finally decided, the expectation is that sales to dealers will be made on the basis of the daily New York gold price, plus a 3 per cent markup to cover costs including advertising by the Mint. The dealers would add a comparable fee in selling to the public and develop a secondary market for the medallions.

Recommendation. The Gold Commission supports the improvement of the program of medallion sales along the general lines that the Treasury plans.

2. Treasury issue of gold bullion coins

In addition to gold medallions we discussed proposals for a Treasury issue of gold bullion coins of specified weights to be offered to the public at a price near market value.

Among those who support the proposal, two conceptions of the character of

the demand for such coins are evident. Some of us expect the demand for such coins to be an investment demand, similar to the demand for krugerrands, maple leaves, Mexican pesos, and other foreign coins that have found a market in this country. Others expect the demand for such coins to be (or have the potential to be) a demand for their use as money. Their value would change from day to day as the value of the gold content of the coin fluctuated in the free gold market.

Some advocates of this proposal see such coins as facilitating development of a dual monetary system, which would impose an additional degree of discipline on discretionary operation of monetary policy.

However, those opposing the proposal believe that ample supplies of gold in forms other than Treasury coins are available to satisfy the demand for gold in the private sector.

So that the new issues may compete with foreign coins, some proponents advise that the former be designated legal tender and as coin of the realm bearing the great seal of the United States, the motto "In God We Trust." In addition, they advise that changes in the dollar value of these coins should be exempt from capital gains taxation.

A Treasury issue of gold bullion coins involves technical matters, on some of which the Commission has adopted recommendations. Congress should explore the following considerations more thoroughly than was possible in our deliberations.

(a) Consideration of a quantity or a price limit on the issue of the coins. This reflects concern that the demand for the coins might exhaust the Treasury gold stock. One approach would be to specify a limit in any legislation to permit coinage. An alternative means of limiting the demand

would be to set a seignorage fee well in excess of costs of minting.

Some who believe the demand for coins would be a demand for money oppose a limit. They would view large scale demand as an indication of public dissatisfaction with the management of the (dollar) money supply and as leading to de facto establishment of a gold coin standard. According to this view, establishment of an arbitrary limit would interfere with this expression of public preferences. A few others of both persuasions favor Treasury purchases of gold to replace gold it has coined. Those who believe the demand for coins would be an investment demand assume that it would not be quantitatively significant, and on this ground would neither oppose nor support a legislated limit.

(b) Enabling legislation to mint coins. Section 5 of the Gold Reserve Act (31 U.S.C. sec. 315b) prohibits the minting of United States gold coin.

(c) The implications of legal tender status for newly minted coins.

Treasury Counsel prepared for us a statement on this matter related to U.S. currency (see annex 2). Legal tender status essentially requires that, in any contract that does not otherwise specify the means of payment, a debt can be discharge by the rendering of any form of U.S. legal tender.

However, whenever a contract specifies a specific means of payment, such as gold, and the debtor breaches that provision and is taken to court by the creditor, the court normally awards damages rather than specific performance of the contract provision.

For some who regard the demand for coins to be an investment demand, legal tender status is an adornment for coins, but nevertheless a sine qua non for generating public acceptance of them.

For some who regard the demand as a demand (or a potential demand) for

money, the implications of legal tender status require further consideration. Absent court enforcement of specific performance of contract provisions to the contrary, a creditor is bound to accept "legal tender" in satisfaction of the amounts due him. Legal tender status for gold coins could compel their acceptance by private creditors or the Treasury in satisfaction of taxes. Formidable problems, involving potential profits and losses to private creditors and debtors, could arise in assigning gold coins legal tender status at market value.

(d) The implications of capital gains exemption for changes in the dollar value of coins. What are the consequences of advocating such exemption for coins but not for gold bullion holdings or, for that matter, not for productive investments? Would legislation to prohibit local government imposition of sales taxes also be required?

(e) Issues by private mints. S. 1704 and H.R. 3789 specify Government coinage of a 5-gram, a 10-gram, a one-troy-ounce-gross and one-troy-ounce-net goldpiece. One-half by aggregate weight of all government-manufactured coins would be the small denominations. In addition, the bills authorize private mints to manufacture gold coins of any size with anyone's picture on its face to circulate as lawful money. The majority of us oppose private minting of official United States coins. We regard the production of "official" coins of a country as a governmental function. The government in effect guarantees the weight and fineness of the "official" coins issued. Private firms are perfectly free to mint gold pieces of any shape and size, so long as they do not purport to be United States coins with a U.S. Government guarantee of weight and fineness. Permission for private firms to mint U.S. coins would open possibilities

for fraud and could involve the Treasury in a new and costly regulatory and monitoring function. Problems would be compounded if the Treasury had a convertibility obligation or an obligation to accept the coins in payment of taxes.

(f) Convertibility at Treasury of gold bullion coins. Of those favoring issue of coins, about half support assumption by the Treasury of an obligation to stand ready to purchase coin offered to it at the market price on the day of redemption, the conversion producing potential profits (or losses) for the Treasury. The bills mentioned above do not contain an explicit provision for convertibility but provide for use of Federal Reserve liabilities tendered in exchange for gold bullion coins to reduce the national debt.

Majority Recommendation. We favor Treasury issue of gold bullion coins of specified weights, and without dollar denomination or legal tender status, to be manufactured from its existing stock of gold and to be sold at a small mark-up over the market value of the gold content, and recommend that the Congress implement this proposal. Furthermore, we recommend that the coins shall be exempt from capital gains taxes and that the coins shall be exempt from sales taxes.

Minority Recommendation. We oppose Treasury issue of gold bullion coins.

3. Treasury issue of gold-backed notes or bonds

Several witnesses at the hearings we conducted suggested that Treasury issue of gold-backed notes or bonds would be a means of introducing gold into our monetary system. A limited issue, for example, of five-year Treasury notes with interest and principal payable in grams or ounces of gold, would provide deferred claims to gold. Successive issues in terms of

gold would eventually become demand claims on gold. Initially, according to the advocates, the yield spreads between gold and inconvertible dollar obligations of the same maturities might be wide. Success in restoring long-term confidence in monetary discipline would eventually narrow the yield spreads. At that time, full gold convertibility of all dollar obligations might be contemplated. These witnesses emphasized the savings on interest payments by the Treasury, assuming the price of gold remained stable or rose only moderately, and hence a positive effect on Federal budget deficits.

In our deliberations, it was noted by opponents of gold-backed Treasury securities that a gold-backed Treasury note or bond, if convertible at maturity at the market price of gold at the date of issue, would in effect be a warehouse certificate for gold. Such an instrument would provide the owner the same chance of gain or loss as owning gold, without his incurring the cost of storage and insurance. No obvious guideline exists for pricing the instrument. A Treasury issue of gold-backed notes or bonds, paying even a low rate of interest, would permit speculation on gold with a sweetener of a coupon. Such issues would be comparable to a bond convertible into the common stock of a corporation that has a low coupon because of the possibility of speculative gain. Purchase of Treasury gold-backed issues would indicate an expectation that the price of gold would rise. The Treasury would then be betting against the market, with no assurance of gain and a major risk of Treasury losses. From a debt management viewpoint, no need exists for gold-backed Treasury issues.

Majority Recommendation. We oppose the issue of Treasury gold-backed notes or bonds.

4. The gold stock owned by the United States Government

As of March 1982, the Treasury Department reported that it held 264 million troy ounces of gold. The bulk of the gold is stored in mint depositories: Fort Knox, Kentucky, and West Point, New York; U.S. Assay Offices in New York and San Francisco; and the Denver and Philadelphia Mints. In addition, the Federal Reserve Bank of New York is the custodian of a part of the gold stock.

a. The public accounting for the gold stock

Citizens have written to us expressing concern about alleged unauthorized large withdrawals from gold depositories. They fear that the actual amounts held by the Government are less than are reported officially. Stories in the press also have referred to missing gold.

Public and Congressional inquiries relating to the accuracy of the accounting records and security of the gold stock were directed to the General Accounting Office (GAO) in the early 1970s. In response, the GAO conducted a partial audit of the gold bars stored at Fort Knox in September and October 1974. In its report on the audit, the GAO recommended cyclical audits of the gold in the custody of the Bureau of the Mint.

During fiscal 1975, at the direction of the Secretary of the Treasury, the Fiscal Assistant Secretary of the Treasury established the Continuing Committee for the Audit of U.S.-Owned Gold stored at various depositories, with the responsibility to conduct audits at appropriate intervals. The Committee consists of one representative each from the Bureau of the Mint, the Bureau of Government Financial Operations, and the Federal Reserve Bank of New York, with GAO representatives invited to observe the audits. As of September 1981, 79.1 percent of the U.S.-owned gold had been audited and

verified. The continuing audit program is planned to provide a complete audit of all U.S.-owned gold by the end of the 10-year cycle in 1984.

The Treasury has provided us with a detailed statement of the results of the continuing audit (see annex 3). A majority of us is satisfied with the Treasury's continuing audit, find it thorough, and believe it should allay any public concern with regard to the accuracy of the inventory, the related accounting records, and the internal controls governing the depositories. One of us, however, expressed a preference for a speedier completion of the audit.

A minority is not satisfied with an audit that spans ten years and contends that 31 U.S.C. 354 appears to require annual audits of the gold inventory. The minority disputes the Treasury's view that a 100 percent audit in a single year is not feasible, since on its own estimate of manpower requirements, 26 men could do it. The Treasury has provided us with an opinion that 31 U.S.C. 354 requires not annual audits but annual settlements of account, which are being performed regularly in compliance with this provision.

Majority Recommendation. We are satisfied that the Treasury is meeting the requirements of 31 U.S.C. 354 regarding annual settlements of account and that the Treasury's continuing audit of the Government-owned gold stock provides an adequate basis for full verification of the accuracy of inventory records.

Minority Recommendation. The Treasury should assign adequate manpower to complete a 100 percent audit of the gold stock every year.

b. The relationship between gold certificates held as an asset of the Federal Reserve System and the gold held by the Treasury

Some citizens have expressed the view that for the Treasury to claim ownership of the gold stock and the Federal Reserve System to show gold certificates as assets appears to be double-counting of the same asset.

The gold is the property of the U.S. Government. The certificates do not represent Federal Reserve ownership of the gold.

Gold certificates, which are valued at \$42.22 per ounce of gold, are issued to the Federal Reserve by the Treasury against its gold holdings. The certificates represent a Federal Reserve claim on the assets of the Treasury, for which the Treasury has received a counterpart deposit in its account with the Federal Reserve

¶ As all gold held by the Treasury has been monetized in this fashion, the Federal Reserve Banks' gold certificate account represents the nation's entire gold stock. New gold certificate credits may be issued only if additional gold is acquired by the Treasury or the statutory price at which gold certificates may be issued is increased. Similarly, gold certificates must be retired by the Treasury upon the sale of gold, with a corresponding decline in the Treasury's deposit balance.

Recommendation. We believe that the Treasury and Federal Reserve are following appropriate procedures in reporting Federal Reserve claims on the Treasury represented by gold certificates and payable in dollars.

c. The appropriate size of the gold stock

At year-end 1949, the U.S. gold stock was a little over 700 million fine troy ounces. At year-end 1967, the stock was about 50 per cent smaller -- 345 million ounces. As already noted, it is now 264 million ounces.

One question we discussed was the appropriate size of the gold stock --

a non-interest bearing asset of the Treasury. All of us agree that a zero stock is not the appropriate size and therefore oppose auction sales which are intended to dispose of Treasury holdings over some stated period of years.

A minority prefers that the Treasury maintain the present stock as an important strategic and monetary resource. The view is consistent with the belief that an increase in the monetary role of gold is not now timely but the stock should be held as a reserve for possible future use, should a restored role for gold then appear feasible, or against other contingencies. In support of this view, it was suggested to us that should an international monetary conference of free world nations be convened to recommend changes in the international monetary system, it would be useful for the United States to hold a substantial gold stock to influence possible future deliberations and to be in a strong position if gold's role were reestablished.

A variant of that view, held by a majority of us, is that some depletion of the gold stock, for example, for the issue of medallions or coinage, is acceptable but to a limited extent only.

Majority Recommendation. We recommend that, while no precise level for the gold stock is necessarily "right," the Treasury retain the right to conduct sales of gold at its discretion, provided adequate levels are maintained for contingencies.

Minority Recommendation 1. We are opposed to auction sales of the gold stock held by the Treasury and recommend that under circumstances such as those that presently exist the stock be maintained at its present size.

d. The price at which to value the gold stock

By statute, the Treasury currently values the gold stock it holds at \$42.22 per ounce. Since the free market in gold was established in 1968, the price has fluctuated between \$35 and \$850 per ounce. It is currently priced at under \$400 per ounce.

One argument for revaluing the gold stock at a price closer to the market price is that it would enable the Treasury to raise revenues by sale of part of its gold. The revenue could be used to retire debt, thus saving interest payments on outstanding Treasury securities, or to finance the current Federal budget deficit. All these objectives are attainable simply by selling gold at the market price, and so there is no cogency to this argument for revaluing the gold stock. The same comment applies to the suggestion that an advantage of an international agreement to value gold at the market is that it might be a step ^toward gold becoming an accepted international medium for payment of balance of payments disequilibria, and that it could also be used for intervention purposes in foreign exchange markets to influence the exchange rate of the dollar.

Another argument is that it is unrealistic to value the gold stock at an outdated fixed price. Doing so distorts the true significance and cost of the U.S. gold asset position.

We regard the choice of a price at which to revalue gold reserve assets as independent of a decision on the price at which to restore a gold standard. One proposal was made during our deliberations for a gradual increase in the statutory price of gold to a price closer to the market price. The proposal was incidental to a plan to require gold certificate reserves be kept behind Federal Reserve notes (see the testimony of Dr. Robert Weintraub in the annex to the report). No other proposal with

respect to the determination of a price at which to revalue gold reserve assets was brought to our attention.

Majority Recommendation. The Commission recommends that the Treasury and the Federal Reserve conduct studies of issues that would be involved in a move towards valuing gold realistically, at something more closely approximating market prices. This change should be subject to the legislative constraint that the proceeds of this new valuation not be monetized by the Treasury or in any way used to enhance the government's spending power. The studies should develop a formula and timetable for valuing U.S. gold stocks in a manner realistically related to gold market value.

Minority Recommendation. We are opposed to revaluing the United States gold stock at a higher price.

e. Managing the gold stock

One general proposition that we examined is the desirability of finding constructive uses of the gold stock rather than keeping it immobile, as is currently the case. Specific suggestions we considered included:

- (1) The United States should offer swaps, leases and make other commercial arrangements with respect to its gold stock in order to generate a modest revenue flow.
- (2) If revalued, gold should be used for intervention purposes in foreign exchange markets and for settlement of the balance of payments (see subject 4d. above).
- (3) The Federal Reserve System should engage in open market operations using gold as well as the government securities.

In our discussion of the general proposition, it was noted that some of

the suggestions would tend to increase the demand for gold and thus raise its price. Yet there are grounds for the belief that should the United States fix a price at which to restore the traditional gold standard, the price would have to be lower than the current market price (see Chapter 4). If the price in the market did not fall once the intention to fix it became known, that would indicate the market's skepticism that the price could be maintained. The sum of the suggested uses would inhibit, rather than promote, a return to the gold standard at a fixed price.

Moreover, if any of the suggested uses of gold yielded a profit, use of the profit to retire public debt or to spend it for budgetary purposes might encourage fiscal imprudence.

Majority Recommendation. We do not favor unconventional uses of the gold stock, since the objectives sought by adding gold to the policy instruments of the monetary and fiscal authorities are attainable without such use and the side effects of so using gold may be undesirable. We do favor continued study of the role of gold in the monetary system and recommend that Congress hold hearings on the subject.

Minority Recommendation. The Commission recommends that the Federal Reserve and the Treasury conduct studies to consider different ways in which gold can be used as a helpful policy instrument. It seems implausible to keep our vast stocks of gold completely idle, if worthwhile uses can be developed which do not entail depleting those stocks.

5. Domestic monetary policy arrangements

Currently, transactions in gold are not used in the implementation of monetary policy by the Federal Reserve System. Gold certificates are carried as an asset of the Federal Reserve and therefore comprise one

element in the sources of the monetary base. However, the Federal Reserve does not use its holdings of these certificates as a device for changing the base.

We considered a number of alternatives that would serve to reintroduce gold into our domestic monetary policy arrangements. The objective would be to improve monetary control through the discipline of gold for the purpose of reducing inflation. Linking changes in the growth rate of money or of some component of money, such as Federal Reserve notes, or of bank reserves, to the change in the gold stock is one approach which was considered for imposing the discipline of gold.

One way to reintroduce gold would be to require the Federal Reserve System to maintain a minimum ratio between the U.S. Government's gold stock and the Federal Reserve monetary base (i.e., Federal Reserve notes plus bank reserves) or some monetary aggregate. A variant would fix upper and lower limits to the ratio, so that the System would be required to take expansionary actions when the ratio was at its upper limit, or contractionary actions when the ratio was at its lower limit. The gold cover requirement might be valued at the official price of \$42.22, or adjusted gradually, or allowed to fluctuate with market prices.

Along traditional gold-standard lines, the United States could define the dollar as a specified weight of gold (that is, fix the price of gold), set gold cover requirements for the Federal Reserve System, and allow the value of the gold stock to be determined by gold flows. If the value of the gold stock rose, the Federal Reserve would be required to undertake actions to expand the money stock. If the value of the gold stock declined, it would be required to take contractionary actions.

Since the decade of the 1970s, not only in the United States but also in other industrialized nations, monetary authorities have experimented with self-imposed rules of conduct of monetary policy, sometimes expressed as target rates of growth of money. Long-term monetary discipline, not linked to gold, has been the objective. A variant of this approach would impose such discipline by legislative prescription, that is, a monetary rule.

Although some opposition was expressed to consideration of domestic monetary arrangements not linked to gold as overstepping the Gold Commission's mandate, in fact we discussed all the foregoing alternatives. In addition, we considered continuation of our present domestic monetary arrangements, under which the Federal Reserve exercises full discretion with respect to monetary actions and chooses the target rates at which it plans to increase different monetary aggregates, reporting to several Congressional committees both its plans and their results.

The majority of us believes that a return to the gold standard is not desirable. Even if that were not our view, for most of us there are two major problems in contemplating the feasibility of a return to a domestic gold standard. One is the absence of a sound guide on how to determine the fixed dollar price of gold at which resumption of a gold cover requirement could be introduced. The other one is the absence of a sound guide on the extent of feasible convertibility of domestic dollar obligations.

Majority Recommendation. The Commission recommends that Congress and the Federal Reserve study the merits of establishing a rule specifying that the growth of the nation's money supply be maintained at a steady rate which insures long-run price stability. In addition, the Commission concludes

that, under present circumstances, restoring a gold standard does not appear to be a fruitful method for dealing with the continuing problem of inflation. The Congress and the Federal Reserve should study ways to improve the conduct of monetary policy, including such alternatives as adopting a monetary rule.

Minority Recommendation. We favor the restoration of a gold standard with a fixed price of gold. It is the means to achieve discipline in the U.S. money base which will then increase or decrease with gold purchases and sales by the monetary authorities.

The Commission was evenly split on the following proposal:

"Whereas the majority of those who supported the creation of the Gold Commission did so with the hope of finding a method for better insuring consistent and persistent price stability and;

Whereas the inflationary process is ultimately related to excessive growth in money and;

Whereas it is clear that inflation cannot persist over the long run in the absence of excessive monetary growth then;

The Commission recommends that the Congress by legislation establish a rule specifying that the growth of the nation's money supply be maintained at a steady rate which insures long-run price stability."

6. International monetary policy arrangements

We discussed a number of aspects of international monetary arrangements during our deliberations.

Under present conditions, the exchange rate of the dollar is determined in foreign exchange markets by the demand for and supply of dollars and also by the demand for the supply of other currencies. The

foreign exchange value of the dollar floats, changing from day to day as market influences (or government interventions) determine. We noted above in connection with subject 4d. that the majority of us oppose using monetary gold revalued at current market prices to intervene in foreign exchange markets.

Adopting a gold standard with a fixed price of gold in terms of dollars would fix exchange rates between the dollar and the currencies of those of its trading partners who also fixed the price of gold in terms of their currencies. Those who support a system of fixed parities argue that it facilitates international trade and finance and, along with convertibility of the U.S. dollar to gold, would promote the goal of internal price stability.

Under present conditions, deficits or surpluses in our balance of payments are settled in dollars automatically. Even though dollars are not convertible into gold at a fixed price, they are convertible into U.S. goods and services including gold at market prices. Other countries and their residents continue to use dollars as an intervention currency in foreign exchange markets, in payments and receipts for international transactions, and as a reserve asset. We do not use our gold in payments and receipts for international transactions and neither do our trading partners.

Most of us believe that even if other countries with substantial gold stocks and the major gold-producing countries were to agree with us on a restoration of an international gold standard, the United States -- and the system as a whole -- would confront an as yet unsolved problem of the vast quantity of dollars world-wide with potential claims to gold

convertibility. We are not in fact aware of international interest in restoring a gold standard. Indeed, a number of foreign officials have expressed negative views towards a gold standard.

One other question we discussed was the desirability of taking steps to seek a restitution of the gold that the United States and other member countries subscribed to the International Monetary Fund (IMF). The United States would be entitled to buy up to 23.6 million ounces of gold from the IMF at SDR 35, or approximately \$40 per ounce at time of writing, if by an 85% vote of the IMF Executive Board a decision were taken to sell gold for currency to members of the IMF in proportion to their IMF quotas as of August 1975.

The argument for such a restitution of IMF gold to its members is that currently gold has no central role in the international monetary system and no longer serves as the common denominator of a par value system or as the unit of value of the SDR; its official price has been abolished; members of the IMF have no obligation to use gold in transactions with the IMF; and the IMF is prohibited from accepting gold unless approved by an 85% vote of its members. The 1976-80 program of IMF gold sales also attests to the intention to establish a diminished role for gold in IMF resources.

The argument against seeking such gold restitution by the IMF is essentially the same one that underlies the belief that the United States should retain significant gold holdings. If gold is an important strategic and monetary resource for the United States, it should also be so regarded by the international community, and retained by the IMF for possible use in various contingencies.

Majority Recommendation 1. We favor no change in the flexible exchange

rate system. In addition, we favor no change in the usage of gold in the operation of the present exchange rate arrangements.

Minority Recommendation 1. We support fixed exchange rates for the U.S. dollar to be introduced at the earliest possible date.

Majority Recommendation 2. We oppose action by the United States to seek a restitution of IMF gold to member countries.

Minority Recommendation 2. We support taking steps to seek a restitution of IMF gold to member countries. One of us believes the recommendation should be considered, with the proceeds to be distributed by the IMF partly to less developed countries. Another one of us would use the additions to U.S. gold stocks for coinage by the U.S. Treasury.

Conclusion

In presenting our report, we are conscious of the complexity of an attempt to define what the role of gold should be in the domestic and international monetary systems.

The majority of us at this time favor essentially no change in the present role of gold. Yet we are not prepared to rule out that an enlarged role for gold may emerge at some future date. If reasonable price stability and confidence in our currency are not restored in the years ahead, we believe that those who advocate an immediate return to gold will grow in numbers and political influence. If there is success in restoring price stability and confidence in our currency, tighter linkage of our monetary system to gold may well become supererogatory.

The minority of us who regard gold as the only real money the world has ever known have placed our views on record: The only way price stability can be restored here (indeed, in the world) is by making the dollar (and

other national currencies) convertible into gold. Linking money to gold domestically and internationally will solve the problem of inflation, high interest rates, and budget deficits.

We have made no attempt to conceal the divisions among us. In that respect, our views probably represent the range of opinions held by the country at large. We hope, nevertheless, that our report will make a contribution to public understanding of the important issues involved. In that event, the time we have devoted to preparatory study before our meetings and to the deliberations themselves will have been well spent.

Chapter 3

Types of Monetary Standards

The original meaning of the term monetary standard was that a particular weight of either gold or silver served as the supreme form of money with which all lesser forms of money were interconvertible. The term has since come to be used as meaning a monetary system, that is, the institutions and practices relating to payments for the settlement of debts. In this chapter, we examine the character of various types of monetary standards, including some of which we have no examples in modern times.

I. Alternative Standards

A monetary standard has two aspects, one domestic and one international. The domestic aspect applies to the arrangements regulating the quantity and growth rate of the internal money supply. The international aspect applies to the arrangements by which the external value of the currency is determined. These two aspects are present for any type of monetary standard.

The two broad divisions of monetary standards are commodity and paper standards. Commodity standards may be based on metals, other commodities, or baskets of commodities including metals. Metallic commodity standards have usually been based on silver or gold or a combination of both known as bimetallism.¹ We limit our examination of metallic standards to variants of the gold standard before turning to the examination of other commodity standards and of paper standards, commenting first on domestic and then international aspects of each. Finally, we consider the strengths and weaknesses of the gold standard variants as a group, of other commodity standards, and of paper standards.

A. Variants of the Gold Standard

The basic argument that is offered in support of all variants of a gold standard is that gold has intrinsic value and therefore serves as a standard of value for all other goods. In addition, supporters view gold as a store of value because new production adds only a small fraction to the stock accumulated over centuries, hence prices denominated in terms of gold will not vary greatly from year to year. If other forms of money exist, for example, government-issued or bank-issued paper currency and bank deposits, then convertibility into gold at a fixed price would assure that, even if inflationary policies were adopted, the monetary authorities would be compelled to abandon such policies. An increase in government paper currency would tend to raise prices in terms of paper currency, would reduce the purchasing power of paper currency, and induce money holders to convert their paper dollars to gold, putting pressure on the government's gold holdings. At the same time, with gold as a country's reserve asset, adjustment to balance of payments deficits and surpluses would be automatic. Thus an increase in the domestic money supply by ultimately raising the price level would raise the price of exports relative to the price of imports, leading to a balance of payments deficit and a gold outflow. In addition, the increase in the money supply would lower domestic interest rates relative to those abroad, inducing a capital outflow and a further gold outflow.

Another attribute claimed for gold standards is that the rate of increase in the gold money supply would vary automatically with the profitability of producing gold, and hence assure a stable money supply and stable prices at least in the long run. Thus, a rapid increase in the

output of gold, due to gold discoveries or technological improvements in gold mining, would raise the prices of all other goods in terms of gold, making them more profitable to produce than gold, and ultimately leading to a reduction in gold output. Moreover, the initial reduction in the purchasing power of gold would lead to a shift in the demand for gold from monetary to nonmonetary use, thus reinforcing the output effects.

Conversely, a decline in prices of goods and services, due to technological improvements in the nongold sector, would increase the profitability of gold production, encouraging increased gold output, which would ultimately tend to raise the price level. The initial increase in the purchasing power of gold would also lead to a shift in the demand for gold from nonmonetary to monetary use, thus reinforcing the output effects. Long-run price stability would be the result.

Gold standards vary depending on the presence or absence of the following elements:

1. a national money unit
 - a. present
 - b. absent
2. Nongold national money issued by either the government or by a fractional-reserve commercial banking system
3. a central bank
 - a. with gold reserves only
 - b. with mainly foreign exchange reserves
4. convertibility of nongold money into gold coin or gold bars
5. classes of holders for whom nongold money is convertible

1a. 100 per cent gold coin standard with national money

Under such a standard, the national unit is defined as a specific weight of gold which thus sets the price of an ounce of gold in terms of that unit. There are 480 grains of gold in a fine troy ounce. Dividing 480 grains by the weight of the national unit in gold yields the price. Defining a dollar, for example, as 11.368 grains of gold sets the price of an ounce of gold at \$42.22+. Under a 100 per cent gold coin standard, gold would be money, but prices would be expressed in terms of the national unit -- dollars, pounds, marks, or francs. Banks would exist to issue warehouse receipts for gold in the national money unit and would hold 100 percent reserves. Terms of loans by the banking system and others would be expressed in the national money unit. Exports or imports of gold coin would be unlimited and free of taxes and restrictions.

The supply of money and the prices of goods in terms of that money would be determined in the market by the demand for gold for monetary and nonmonetary uses and by the supply of gold, which would be governed by the opportunity cost of producing gold. The demand for gold for nonmonetary use would be governed by the relative price of monetary gold and all other commodities. The demand for monetary gold would be governed by (a) total wealth available to hold in asset form; (b) the total amount of goods and services produced; (c) the average price of those goods and services; (d) the return on holding monetary gold relative to the return available on alternative assets; and (e) the tastes and preferences of holders of money.

In this system, the market would be free to choose forms of money other than gold and warehouse receipts.

Government intervention in the monetary system would be limited to its

undertaking to buy gold from the public at a fixed price and converting it into coin, and to sell gold to the public at a slightly higher fixed price, if it so chose, the difference between the two prices representing brassage -- the government production fee to cover cost of coin manufacture.

The determination of the external value of a national currency under a 100 per cent gold coin standard may be explained with an example drawn from a variant of the gold standard to be discussed below. The principle is the same for all variants based on a national monetary unit.

The external value of the currency is fixed in terms of gold. For example, consider the reason the external value of a dollar in terms of a pound sterling was \$4.8665 before World War I and from 1925 to 1931. The dollar was defined as 23.22 grains of fine gold and a pound sterling as 113.0016 grains of fine gold, hence 4.8665 was the multiple of the weight of gold in a pound sterling compared with the weight of gold in a dollar. This was a fixed exchange rate because the gold weight of each currency was fixed or, equivalently, the price of gold per ounce was fixed. If the United States had adopted one price of gold and the British another price, obviously, the equivalence between the exchange rate and the respective weights defining each currency would have disappeared. A variable price of gold among countries would have meant variable weights of gold represented by each currency.

The link between currencies is gold at a fixed price. Imbalances in international payments might be settled by claims on the national currencies of other countries which had fixed gold equivalents, financed in the example cited mainly by the use of bills of exchange. If the demand for and supply of a national currency did not balance, gold flows would be

activated. Thus whenever the dollar price of a British pound at the official or par exchange rate of \$4.86 deviated by more than one or two per cent above or below par (these limits, referred to as the gold points, represented the cost of transferring -- packing, shipping, and insuring -- gold between the two countries), it paid either to convert U.S. dollars into gold and transfer it abroad, or else to convert British pounds into gold and transfer it here. If U.S. demand increased, for example, for cheaper British goods, this raised the dollar price of the pound (that is, bills of exchange). Once the dollar price of the pound reached \$4.92, referred to as the U.S. gold export point, it paid to convert U.S. dollars into gold, ship the gold to England and purchase pounds at \$4.86. Conversely, at the U.S. gold import point, which might have been as high as \$4.83, it paid to convert pounds sterling into gold, ship the gold to the U.S., and purchase dollars. Gold shipments in either direction would then act to restore the price of foreign exchange to parity.

Thus it is not only gold flows from new gold output but inflows or outflows related to movements in the balance of payments that affect the size of the domestic money supply. A reduction in a country's domestic money and ultimately in its price level enhance the country's appeal as a source of goods and services to foreigners and reduce domestic demand for foreign goods and services. An increase in a country's domestic money and ultimately in its price level diminish that country's appeal as a source of goods and services to foreigners and increase domestic demand for foreign goods and services. Thanks to this automatic adjustment process, the duration and size of imbalances of international payments would tend to be self-limiting. Gold flows serve to equalize price movements across

countries.

Economists debate the details of the process just described.² Some argue that gold flows under the gold standard before 1914 were minimal and that prices worldwide adjusted rapidly. There was one world price level and the external adjustment process posed no greater problem than interregional adjustment of prices within a country. These are refinements that need not detain us.

1b. Gold standard without national money

The key feature of such a standard is that the role of government in it at most would be limited to assuring the weight and fineness of coins minted by the private sector. No national money unit would exist -- no dollars, pounds, marks, or francs. Coins of different weights would circulate and prices would be denominated in weights of gold. Banks might exist to issue warehouse receipts for gold with a cover of 100 percent reserves. Borrowing and lending, limited to the private sector, would be conducted, the debt instruments denominated in weights of gold. Settlement of international payments would rarely be made in weights of gold. Instead, international capital flows would occur in the form of interest-bearing debt instruments, denominated in weights of gold, or the transfer of ownership of equities to foreign holders.

The proponents of the conception of the gold standard here sketched regard it as superior to any other form of monetary standard because it eliminates money creation by both government and banks. In their view the record of government and banks shows them to have overissued the currency. In a real gold standard, such as the one described, the quantity of gold available for monetary use would determine the level of prices. If the

demand for gold exceeded the supply, prices, expressed in weights of gold, would fall.

In the ideal arrangement that is proposed, the market might choose forms of money other than gold and warehouse receipts, including promises to pay gold on demand or at a future date. Private contracts would specify payment in whatever form was mutually agreeable, including the use of technological means for electronic transfer of funds that could significantly economize the means of making payments with physical gold or the need to hold gold in physical possession.

Introducing de novo a real gold standard would clearly change the character of the existing political and financial system.

2. Gold standard with nongold money issued by either the government or a fractional-reserve commercial banking system

The earliest departure from the ideal 100 per cent gold coin standard was the creation of substitutes for gold. The motive for substitution was a reduction in the real resources employed in mining gold. Paper money substitutes may be produced with much smaller real resources. Such substitutes included fiat currency issues by governments and commercial bank issues of notes and deposits, with gold reserves of the government and banks equal to a fraction only of their monetary liabilities. The incentive to limit the size of the fraction of gold reserves was strengthened during trend periods when the supply of gold did not keep pace with the demand for it for monetary and nonmonetary uses.

Fractional gold reserves were held as an earnest of issuers' readiness to convert nongold money into gold at the pleasure of the holder, at a fixed price of gold, not a changing market price of gold. In this system,

domestic disturbances, such as banking panics, could affect the size of the country's gold reserves. Public alarm about the adequacy of the gold reserve ratio could trigger an internal drain of gold, when holders chose to shift from bank notes or bank deposits to gold. In the aftermath of such episodes, an increase in the gold reserve ratio was produced usually by a contraction of the issuers' monetary liabilities.

A fractional reserve gold standard accentuated the effects of gold flows on the quantity of money. A one-dollar gold inflow, depending on the size of the reserve ratio, might increase the domestic quantity of money as much as \$8 or \$10, a one-dollar gold outflow might reduce the quantity of domestic money by as much as \$8 or \$10, with parallel effects on domestic spending and prices.

However, as noted above, international capital flows alleviated to some extent either the size of gold flows or their consequences. Short-term capital flows served to reduce and smooth the immediate flows of gold that would otherwise have been required to settle payments imbalances.

Long-term capital flows enabled developing countries to borrow real resources from developed countries by running a persistent excess of imports of goods and services over exports of goods and services without entailing gold flows. In the event of a rise in the domestic quantity of money, in the short run, interest rates would tend to decline, inducing investors to shift funds to foreign money markets. The size of the change in export prices relative to import prices that would otherwise have occurred would be reduced by the resulting gold outflow.

. In a fractional-reserve banking system and a gold standard with a national money unit, domestic and international convertibility of claims on

the monetary authorities was the mechanism to insure that nongold money growth was held in check.

3a. Gold standard with a central bank holding gold reserves only

Central banks in Europe predated the gold standard. Their behavior did not always serve the discipline the ideal gold standard imposes. They did not necessarily respond to a loss of gold due to balance of payments deficits by actions to reduce the domestic quantity of money outstanding, or to a gain of gold due to balance of payments surpluses by actions to increase the domestic quantity of money outstanding.

Scholars continue to debate the extent to which such behavior by the Bank of England and other central banks characterized the period before 1914. After World War I, the issue is not in doubt: central banks, including the Federal Reserve System, frequently chose not to permit gold flows either to expand or contract the domestic quantity of money, or to do so to a lesser degree than full adjustment would have required. The gold standard was not automatic but managed.

3b. Gold standard with a central bank holding mainly foreign exchange reserves

Central banks also learned to economize on gold holdings by using other currencies as reserve assets, principally sterling before 1914, increasingly dollars thereafter. A country that holds all or a large part of its monetary reserves in the form of foreign exchange, that is, claims on a country that is on a gold standard, is said to be on a gold exchange standard. Gold holdings are non-earning assets. For that reason the gold exchange standard has appeal since foreign exchange, in the form of deposits at foreign banks or foreign treasury bills, provides earning

assets. Of course, a country holding foreign exchange reserves in a currency that devalues sustains losses.³

The gold standard before World War I was often described as a sterling/gold exchange system, under the Bretton Woods system after World War II as a dollar/gold exchange system. Both were fixed exchange rate systems in conception, but the Bretton Woods system became an adjustable pegged exchange rate system.

The par value of each national currency was expressed either in terms of gold or in terms of the U.S. dollar of 13.71 grains of fine gold, each established in agreement with the International Monetary Fund. Members of the IMF were responsible for maintaining the par value of their currencies, with the United States alone undertaking the free purchase and sale of gold at the fixed price of \$35 per ounce. Other countries bought and sold their currencies for dollars to maintain their par values within agreed limits. Settlement of international payments imbalances took place mainly by transfers of reserve assets in the chief money markets.

The system was characterized by repeated foreign exchange crises as market participants anticipated that existing par values were unsustainable and shifted funds from a weak currency to a strong currency, exacerbating the domestic position for both currencies. Countries with undervalued currencies resisted revaluation and countries with overvalued currencies resisted devaluation.

The system of fixed but adjustable pegged exchange rates collapsed under the pressure of persistent deficits in the reserve center country's balance of payments that produced inflationary pressures on the rest of the world. The U.S. money supply grew at rates independent of the

country's balance of payments position, contrary to the case under an international gold standard. Dollar reserve accumulations abroad, unless sterilized by monetary authorities, expanded the monetary bases of our trading partners. According to them, the United States exported inflation to the rest of the world through its balance of payments deficits.

4. Gold standard with convertibility of nongold money into gold coin or gold bars

In the gold coin standard with a national money unit and nongold substitutes, such as existed in a number of countries before 1914, gold coin circulated -- usually a minor fraction of aggregate domestic money -- and nongold money was redeemable in coin. Again, as a way of economizing on the use of gold, many countries ceased to coin gold after 1914 (the United States, not until 1933). Thus free coinage, circulation of gold coins, and the legal tender status of gold coins terminated. The aim was to concentrate all of a country's gold holdings into reserves available for international payments. Nongold money became convertible into heavy gold bars. Such a gold standard is known as a gold bullion standard.

5. Gold standard with classes of holders for whom nongold money is convertible

Under a gold coin standard with a national money unit and nongold substitutes, all holders of nongold money -- domestic and foreign -- could convert it into gold coin. Under a gold bullion standard, convertibility could exist for both classes of holders. Under the Bretton Woods dollar/gold exchange standard, convertibility in the United States was limited to foreign official institution dollar assets. Foreign institutions willingly held dollars for the purpose of intervention so

long as they were confident that they could obtain gold from the United States for dollars at their initiative. A gentleman's agreement among central banks not to present dollar balances for convertibility into gold for a time staved off the denouement. The chronic deficits in the U.S. balance of payments and the unwanted accumulations of dollars by foreigners which threatened to drain all U.S. gold finally led to formal inconvertibility for all holders in 1971.

B. Variants of Other Commodity Standards

Economists have long argued that a commodity standard with a bundle of commodities is superior to a single commodity standard like the gold standard.⁴ The reason is that such a scheme could mitigate the price level instability produced by basing the standard on one commodity like gold, produced by unexpected changes in its demand and supply. Technologically induced changes in relative costs of production of some of the bundle would be offset in the rest of the bundle.

The usual prescription for the bundle of commodities is that it would include standardized staples like metals and manufactured commodities that are traded in broad markets. The precise composition varies with the author of the plan for a commodity standard. In support of such a standard, it has been argued that possible monetization of the bundle of commodities would provide producers with a floor to their incomes, while convertibility into currency would impose a ceiling on the market prices of the bundle.

If nonmonetary stocks of the commodities available for use as monetary stocks were small, the quantity of money would change primarily through additional current output or withdrawals for current use. Since the

commodity industries represented in the bundle would have a fairly elastic current output, any decline in other prices would induce a substantial increase in their output, adding to the stock of money and current income. Opposite effects would occur with any rise in other prices. Changes in the quantity of money would affect the volume of real assets held by the public and the fraction of total assets held as money, causing the community to alter their expenditures in a countercyclical fashion. Thus, commodity currency could have substantial countercyclical effects.

Plans for a commodity standard differ on the role of government and the provision for a reserve. The government's role could be limited to the announcement that the monetary unit is defined as specified amounts of each of the bundle of commodities. The private sector would then issue financial instruments denominated in the unit. The government would have no role as an issuer of currency. Some plans envisage no government reserves of the bundle of commodities. Instead, the private sector would hold reserves in order to redeem the financial instruments -- say, warehouse receipts for the bundle -- issued by it. Again, fractional reserve holding might well be a development of a commodity standard, given the incentive to reduce resource costs of holding 100% reserves.

Private individuals would use the warehouse receipts to obtain from the issuers commodities covered by the standard and sell to the issuers for warehouse receipts commodities covered by the standard. A deflationary tendency would encourage production of the commodity bundle that would be exchanged for newly issued warehouse receipts at the fixed price, thus countering the initial tendency. An inflationary tendency would lead private individuals to redeem the warehouse receipts in commodity bundles,

thus countering that tendency. In this way, self-interested actions by individuals in the economy would maintain the stability of the price level and so preclude deviations in the price level over the long run.

If a commodity standard were adopted internationally, it could provide an international currency with fixed exchange rates.

C. Paper Standards

Under a paper money standard, it is essential to anchor the system to a nominal fiat reserve - what economists call "outside" money, provided by a central bank, another governmental agency, or even a nongovernmental agency. In our paper money system, the monetary base of the Federal Reserve System serves as outside money. First, we examine current monetary arrangements and then, by contrast, arrangements that would prevail under a radical restructuring of the monetary system.

1. Current Monetary Arrangements

Our current monetary arrangements rely on the discretion of the Board of Governors of the Federal Reserve System. To insulate the Board from short-run political pressures, safeguards are provided by the staggered 14-year terms of the governors, the decentralization and somewhat autonomous regional Reserve Banks, the independence from Congressional appropriations, and the Federal Advisory Council as a watchdog. Congress has no direct supervisory authority over either the Board or the Reserve Banks, although the chairman of the Board testifies frequently before various Congressional committees.

It is the responsibility of the Federal Reserve Banks to provide without limit the amount of paper currency that the public demands. A limit on the quantity of paper money that the Federal Reserve could print

existed before 1968 when it was required by law to keep a 25 percent gold backing for each dollar it issued. Instead of controlling the amount of currency in circulation --it now constitutes about one-third of the money supply defined as the sum of currency and all demand deposits -- the Federal Reserve attempts to control the demand deposit component of the money supply.

The most important tool the Federal Reserve possesses for monetary control is its portfolio of government securities. It is through increasing and decreasing its holdings of government securities that the Federal Reserve is able to effect changes in the reserve positions of banks. When the Federal Reserve buys government securities, it pays for them by adding to bank reserves. Federal Reserve sales of government securities reduce bank reserves. Banks expand their lending activities, and hence increase demand deposits, when their reserves increase. The opposite effects occur when their reserves decrease. Changes in its portfolio thus enable the Federal Reserve to control, over a period long enough for the banks to react, the amount of demand deposits created by the banks.

Currently, the dollar's foreign exchange value is determined by changing supply and demand in the foreign exchange market, whether because flows of goods and services to and from other countries vary, or because of long-term or short-term capital movements, or of interventions by monetary authorities to influence the foreign exchange rate of their currencies vis-a-vis the dollar.

2. Radical Proposals

Radical proposals to change current monetary arrangements, while

maintaining a paper standard, derive from concern over the record of monetary instability associated with the operation of paper money standards. Proposals for reform range from the introduction of 100% reserve requirements for banks of issue, to rules limiting the discretion of the Federal Reserve System in creating reserves for the banking system, to proposals by F.A. Hayek and others calling for the free private production of money and currency competition among issuers of money.⁵

Advocates of basing monetary policy on a rule, such as requiring the Federal Reserve to increase the money supply at a fixed rate, contend that such a policy would promote price stability and dampen cyclical changes in the economy. For them, discretion is politically and economically objectionable.

Suggestions for improving the performance of our paper standard include introducing 100% reserve requirements for banks, payment of interest on bank reserves, and payment of interest on demand deposits. The advantage of a 100% reserve requirement is that it would reduce monetary instability by eliminating fluctuations in the banks' reserve-deposit ratio and the public's currency-deposit ratio that currently introduce some slippage between the Federal Reserve's provision of reserves and the change in deposits the banks create. By paying interest to banks on their reserves, the incentive to evade the requirement would be largely eliminated. Moreover, by paying interest on demand deposits, individuals would hold the optimum quantity of money in their circumstances. If interest is not paid on deposits, individuals must take into account the return they could earn on interest-bearing assets, reducing cash holdings by employing, say, more bookkeeping services to compensate for the loss of not holding the

alternative asset. Since money is costless to produce, holding smaller than optimum balances is a wasteful use of real resources.

In the schemes for free competition in money, private issuers would be free to produce as much of their money as they wished and users of money would be free to choose whichever currency suited them best, presumably one with stable buying power. Currency competition would be compatible with any exchange rate regime, either flexible or fixed.

One such proposal urges the United States to adopt parallel currencies: dollars and gold. The supply of dollars and hence the price level in terms of dollars would be determined by the Federal Reserve (by discretionary monetary policy), the supply of gold used as money and hence the price level in terms of gold by the free market. The relative price of the two currencies (their exchange rates) would vary depending on conditions in the gold market, the monetary policy actions taken by the Federal Reserve, and the public's taste for the two currencies. According to this scheme, were the cross-elasticity of demand between the two currencies high, then a fall in the price of the dollar (that is, a rise in the price level) would lead to a massive shift into gold. In some respects, the experience of California in the greenback period (1862-78) was an example of this scheme: gold and greenbacks circulated freely at flexible rates and were both used as exchange media. In addition, proponents of such a scheme argue that shifts from gold to dollars and from dollars to gold would act as a signal to the Federal Reserve to intervene, decreasing monetary growth when the public shifted away from dollars into gold, and increasing monetary growth when the public shifted away from gold into dollars.⁶⁹ The advocates of free currency competition regard it as needed to achieve price level stability,

as leading to optimum currency areas, and eventually to currency unification, as users of money choose the most useful money.⁷

II. Strengths and Weaknesses of Alternative Standards

We prefix an evaluation of the strengths and weaknesses of the three types of monetary standards we have described by the tabular presentation in Table 3-1. It lists seven criteria of desirable attributes of a monetary standard:

- a. flexibility, that is, the ability to accommodate real economic growth as well as financial innovation
- b. resistance to domestic and foreign shocks both of a monetary and non monetary character
- c. freedom from political manipulation
- d. magnitude of associated resource costs
- e. provision of long-run price predictability, in the sense of mean reversion of the price level.
- f. provision of long-run price stability
- g. provision of short-run economic stability, that is, stability of prices and real output

A check in a column of the table indicates that the standard satisfies the criterion, an x indicates that it does not, and a question mark indicates that the effects are uncertain.

A. Gold Standard Variants

1. The pure gold coin standard: a 100% gold coin standard (a) with national money and (b) without national money

Since we have no empirical basis on which to form a judgment with respect to the qualities of a 100% gold standard with or without a

Table 3-1

Criteria for Evaluating Alternative Monetary Standards^a

Monetary Standard	Flexibility	Resistance to Shocks	Freedom from Manipulation	Low Resource Costs	Long-run Price Predictability	Long-run Price Stability	Short-run Economic Stability
A. Gold							
1. Pure variants	X	X	/	X	/	?	X
2. Classical variants	X	X	X	b	/	?	X
B. Commodity	/	X	/	X	/	/	?
C. Paper							
1. Current	/	/	X	/	X	X	?
2. Radical variants ^c	?	/	/	/	?	?	?

^a Check means standard satisfies condition, X means it does not; question mark indicates effects are uncertain

^b Resource costs were reduced in variants of the classical gold standard, particularly so for countries on the gold exchange standard

^c Competing monies variant

national money unit, our evaluation is based on theoretical considerations.

Both standards, in common with all commodity standards, would be free from political manipulation but, on the other hand, would exhibit a number of negative features. These include high real resource costs of their establishment and operation; inability to accommodate real growth if technological progress in gold mining and new mine discoveries do not keep pace with the growth of the rest of the economy; long-term inflationary or deflationary movements of the price level, depending on the rate of growth of the monetary gold stock relative to the demand for gold; susceptibility to shocks from both home and foreign changing conditions of supply and demand, each of which in turn could produce short-term economic stability.

If the standard with or without a national money unit literally were limited to or based on the existing gold stock in a country plus annual additions from gold output, long-term inflationary or deflationary movements of the price level would be possible, depending on the rate of growth of the monetary gold stock relative to the demand for gold. These movements impose costs on the economy. It matters little if a loan contract is denominated in a weight of gold rather than a nominal dollar amount if the conditions ruling when the contract is entered into have changed when the terms of the contract have to be fulfilled. Lenders or borrowers can be harmed, depending on whether inflationary or deflationary forces prevail. Foresight with respect to future long-term changes in demand for or supply of gold exceeds investor capacity to encompass in a loan contract. This aspect of a gold standard cannot be

neglected.

One other aspect of a gold standard with or without national money is that the traditional view that gold production varies positively in response to changes in its real price does not appear to be true currently (see Chapter 4). On the supply side, South African mines produce less when the price is high because they can work poorer ores. Nor does it seem to be the case currently that an increased real price of gold leads to shifts from nonmonetary to monetary stocks. If the price of gold were fixed and inflationary expectations vanished, it is conceivable however, that the responses on the supply and demand sides might change.

Another feature of the two theoretical variants invites comment -- the feature that allows for possible introduction by the market of fiduciary monies by issuers who promise to pay gold by weight or in coin of the realm on redemption. If such monies were not always redeemable, as the issuer promised, it is likely that government would become involved in the money creation process if only to enforce contracts and to prevent fraud. Moreover, when an issuer fails to fulfill his promise to those who entered into a contract with him, third-party effects also occur -- the holder of the monies will default on payments owed by him to third parties. For this reason, government is likely to be drawn into the money creation process in order to set limits on the size of the fiduciary issue and otherwise regulate promises to pay gold. The rationale for a gold standard without national money as free from government intervention is weakened by the feature in question. It undermines the case for a 100% gold coin standard.

This feature also has a bearing on the claim made that high resource costs are a positive value of gold standards. If this were so, they should not occasion the introduction of substitutes for gold in circulation and in reserves. To suggest that markets might introduce such substitutes in the ideal gold standards belies the claim made for the beneficence of high resource costs. The market will seek means to achieve at lower resource costs what the gold standard is designed to achieve at much higher resource costs.

2. Variants of the classical gold standard

We can summarize the strengths of the gold standard variants of historic experience, and we can then inquire why, given these advantages, the United States and the rest of the world retreated from them.

We note the following advantages conferred by a gold standard. One: A gold standard promotes long-term domestic and international price predictability. This condition provides incentives to private market agents to make long-term contracts which are vital for the efficient operation of a market economy. In addition, such long-term price predictability minimizes confusion between relative and price level movements, so that economic agents do not experience false signals with regard to real economic decisions. Two: Government intervention in the determination of the price level and overall level of economic activity is limited under a fully functioning gold standard. Three: Fixed exchange rates create the efficiencies of a stable international money that integrates the world's commodity and capital markets.

The short explanation of the world's retreat from a gold standard,

given its advantages, is that, whether advisedly or not, the world came to prize other goals than those of the gold standard. All gold standard countries confront destabilizing conditions on the supply side, due to gold discoveries, and on the demand side, due to the spread of the gold standard when additional countries adopt it. Improving the real performance of the economy was given pride of place. To achieve the improvement, the task was assigned to government management of monetary and fiscal policy, rather than to private sector initiatives. Only the role of fixed exchange rates carried over to the postwar world but fundamentally divorced from the gold standard restraints. Under Bretton Woods, there was no provision that the internal supply of a country's currency was to be governed by its gold holdings, as was the case under the gold standard, nor was there a requirement that a country had to undergo deflation or inflation domestically to balance its external accounts. This dilution of gold standard discipline is an example of its institutional vulnerability. The gold standard was abandoned for shorter or longer periods whenever adherence to it was deemed costly.

The goal of stabilizing the real performance of the economy in the postwar period seemed incompatible with the gold standard. A fully functioning gold standard requires short-term adjustment of the domestic economy to correct balance of payments disequilibria. Such adjustments entail short-term price instability and short-term output instability, which means fluctuating employment. In addition, fixed exchange rates transmit real disturbances in one country to the rest of the world. A timely example is the size of adjustment costs that would have occurred, had the world been on fixed exchange rates from 1974 on. The increase

in the price of oil led to a redistribution of international monetary reserves from oil-importing to oil-producing nations. Under fixed exchange rates, the domestic price level in oil-importing countries would have been subjected to a massive deflation. More generally, under fixed exchange rates, a boom in one country will lead to an increase in demand by its residents for goods and services in the rest of the world. The opposite will happen in the case of a recession.

For these reasons the value of external stability in maintaining a fixed rate of exchange between the domestic money and foreign moneys came to be regarded as purchased at the cost of instability in the domestic money supply, domestic spending, prices and employment. The simple rule for governments to maintain a fixed price of gold was overthrown in the 1970s, but the seeds of the downfall of that rule were sown earlier in postwar years as country after country opted for monetary independence, full employment and economic growth. Countries rejected the restraints that the operation of a gold standard imposed on the pursuit of these widely supported national objectives. In the United States, where the share of international trade was a minor factor in aggregate national income, the view prevailed that the domestic economy should not be hostage to the balance of payments. Maintenance of the price of gold was not an objective of either the Employment Act of 1946 or the Humphrey-Hawkins Full Employment and Balanced Growth Act of 1978.

B. Variants of Other Commodity Standards

The proposed commodity standards have no empirical counterparts, so we compare their strengths and weaknesses with the gold standard and

paper money standards.

Technically, commodity standards appear to be superior to a gold standard because nonmonetary production of commodities that might be included in the bundle is a larger fraction of aggregate output than is nonmonetary production of gold. The broader base might therefore provide a more stable price level under a commodity standard, but it is not obvious that that would be the case. Had prices of commodities been expressed in terms of a currency unit consisting of a bundle of commodities rather than in terms of gold, the general price level probably would have fluctuated as much as it actually did, say, from 1800 to 1950. In addition, changes in the relative cost of the commodities in the bundle, just as changes in the cost of gold, would contribute to price instability. Commodity currency, however, would offer greater countercyclical effects on income and thus on the money supply than would a gold-based currency.

In other respects, the two standards are similar under 100% reserve or fractional reserve arrangements and both can serve as international currencies. The one respect in which a gold standard is clearly superior to commodity standards is that gold commands broad support by many people and European central bank governors as the most trusted money. Commodity standards have no such emotional appeal. Holding stocks of gold may be acceptable to the public. Holding stocks of useful goods would probably not be understood or countenanced.

If a commodity standard with 100% reserves were set up, it would be preferable to a paper money standard with discretionary control of the money supply. The commodity standard would be separate from the

government budget and less subject to overissue. However, it would still be subject to instability reflecting changing relative prices and the risk of deliberate manipulation by countries having monopoly power over one or more commodities in the bundle. For example, if one of the countries on a commodity standard failed to adhere to it, say, by impeding the free movement of the commodities in the bundle among the countries adhering to the standard, the policies of the destabilizing country would have damaging effects on the others. Restrictions on international trade would likely be introduced generally. In addition, if a significant change occurred in either the supply of or demand for one commodity in the bundle which is produced primarily in one country, that could lead to instability, were that country to exercise its monopoly power.

With fractional reserves, there is no clear advantage of a commodity standard over a paper money standard unless adherence to rules were scrupulously observed under the former but not the latter standard. Under the commodity standard, shifts from monetary to nonmonetary stocks of commodities in the bundle change the supply of money. It is an advantage that no such shifts occur under a paper money standard.

The final assessment is that commodity standards are more complex and entail greater resource costs than would exist under a properly managed paper standard.

C. Paper Standards

Paper money is valued only because others will accept it in exchange for valuable goods and services, and not because of any intrinsic value. The chief advantage of all paper standards, including the present one,

is that they exact minimum costs in the form of resources used to produce the money supply, and they are sufficiently flexible to accommodate economic growth. Moreover, if accompanied by flexible exchange rates, they can insulate the economy from external shocks.

1. Current Monetary Arrangements

For some observers, the discretionary character of the paper standard is an advantage. Monetary authorities have a choice of policy goals and are free to determine how to use their powers to attain them. As problems change, their goals may change.

Other observers view the historical record of our fractional reserve managed paper money system as one of considerable instability both in the short run and the long run and have advocated a number of proposals designed to reduce:

instability associated with fractional reserve banking
(100% reserve proposal)

instability associated with discretionary policy
(monetary growth rules)

and inefficiencies associated with the costlessness of producing paper money balances (paying interest on bank demand deposits).

2. Radical Proposals

Finally, we evaluate the case for competing monies. Its principal appeal lies in its reliance on the impersonal forces of the market rather than the monopoly power of government. However, unless brand names can be attached to competing private monies, that is, unless the public can be guaranteed that private money issuers will not overissue

for private gain, it seems likely that government regulation will be necessary.⁸

With respect to the proposal for a parallel currency, the extent to which it would contribute to price stability depends on the reason shifts would occur between dollars and gold. If a shift occurred because of overissue of dollars, Federal Reserve actions to reduce the money supply would be desirable. However, if a shift reflected a change in the public's taste for gold and dollars unrelated to price behavior, or to a shock in the gold market, then such actions would be undesirable. The question then arises, how would the Federal Reserve know the source of a shift?

U.S. experience under the greenback standard is not comparable to the proposal for a parallel currency. In the greenback era, the price of gold was fixed by Great Britain. What varied was the dollar price of gold, reflecting a changing value of the dollar. The country had a dual currency system because dollars were used for domestic purposes, gold for international transactions (with the exception of California, where gold was also used for domestic transactions). The fact that the rest of the world was on a gold standard maintained by the British ensured that the U.S. arrangement would be temporary, lasting only until the U.S. price level in terms of dollars fell enough to make resumption of payments in gold possible at the prewar parity. Hence market participants' relative holdings of gold and dollars would reflect expectations on the timing and pattern of resumption rather than the free market factors stressed by proponents of this proposal.

Finally, the optimum currency area (the maximum geographical area

area over which one money can provide price stability) may be so great that only the governments of very large economies can effectively provide the money supply.⁹ Even those sympathetic to the proposed change may conclude that currency competition will ultimately self-destruct, since one currency will outcompete all others. The money industry is a declining cost industry that is a natural monopoly, which at some stage would be nationalized.¹⁰

III. Conclusion

Each of the standards has advantages and disadvantages. Existing and historical standards were adopted (evolved) as a response to different economic and social priorities of the period as well as in response to the purely economic considerations of the resource costs involved. Thus the classical gold standard prevailed in a world characterized by free markets, free mobility of labor and capital, and distrust of government intervention. In this environment, in which national economic growth and high employment were not given the weight assigned to them today, the automatic working of the gold standard was preferred to the "evils of managed money." Hence it is difficult to make the case for one standard over another divorced from the prevailing concerns of the time. Nevertheless, on the grounds of the criteria listed in this chapter, the gold standard may not be the standard best suited to current problems.

Notes to Chapter 3

1. The great English economist Alfred Marshall also proposed a combination of silver and gold that he designated symmetalism. He argued that a bimetallic standard would inevitably degenerate into a single standard of either gold or silver, one metal tending to drive the other out of circulation. Symmetalism was a plan to make a composite bar of fixed proportions of gold of given weight with a weight of silver, say, twenty times greater, the government undertaking to buy or sell on demand the composite bar for a fixed amount of currency. Neither metal separately would be convertible into currency at a fixed rate nor would currency be convertible at a fixed rate into either metal. See Memorials of Alfred Marshall, ed. A.C. Pigou, Macmillan: London, 1925, pp.204-06.
2. See, for example, D.N. McCloskey and J.R. Zecher, "How the Gold Standard Worked, 1880-1913," in J.A. Frenkel and H.G. Johnson, eds., The Monetary Approach to the Balance of Payments, Toronto: University of Toronto Press, 1976.
3. As happened when sterling was devalued in 1949 and 1967.
4. A survey of the pre-1950 literature on commodity standards may be found in Milton Friedman, "Commodity-Reserve Currency," in his Essays in Positive Economics, Chicago: University of Chicago Press, 1953, pp. 204-50. See also Robert Hall, "The Government and the Monetary Unit," unpublished paper #159 of the National Bureau of Economic Research Inflation Project.
5. See his Choice in Currency, A Way to Stop Inflation, The Institute of

Economic Affairs, Occasional Paper 48, London: February 1976;

Denationalisation of Money, An Analysis of the Theory and Practice of Concurrent Currencies, The Institute of Economic Affairs, Hobart Paper Special, No. 70, London, October 1976.

6. See Joe Cobb, U.S. Choice in Currency Commission, "Rahn Proposal for Capital Gains Treatment of Gold Coins" (February 10, 1982).
7. There is some historical precedent for competing monies. Such a system was quite successful in late eighteenth and early nineteenth century Scotland and in antebellum United States (except for wildcat banks). See Lawrence White, "Free Banking in Scotland Prior to 1844," Unpublished Ph.D. dissertation (November 1981), and Hugh Rockoff, "The Free Banking Era: A Re-examination," Journal of Money, Credit and Banking 6 (May 1974): 141-68.
8. See Benjamin Klein, "The Competitive Supply of Money," Journal of Money, Credit and Banking 6 (November 1974): 423-53.
9. Indeed, many countries in Latin America and the Caribbean have tied their currency units to the dollar. See Michael Conolly, "Optimum Currency Pegs for Latin America," Journal of Money, Credit and Banking 14 (forthcoming).
10. See Roland Vaubel, "Free Currency Competition," Weltwirtschaftliches Archiv 113, 1977, no. 3, pp. 435-61.

Chapter 2

The Past Role of Gold in the U.S. Monetary System

From 1834 to 1973, with the exception of the years 1862 through 1878 and of an interlude of less than a year's duration in 1933-34, the United States adhered to some form of a gold standard. The purpose of this review is to examine the operation of the successive types of gold standard in U.S. experience (including for each type the evidence on the stability of the price level and of real output), as well as the intervening episodes of floating exchange rates.

Chronologically, U.S. experience with the gold standard may be characterized as follows:

1. 1834-1861: a de facto gold standard in a largely bimetallic international monetary system
2. 1862-78: the greenback standard
3. 1879-1914: a gold standard without a central bank, and a fractional reserve banking system, as part of an expanding international gold standard
4. 1914-1933: a managed gold standard, under the Federal Reserve System, which was legally obligated to maintain minimum gold reserves against its monetary liabilities, in a short-lived postwar international gold exchange standard
5. 1933-1934: a floating dollar in an international monetary system split between a depreciated sterling area and a gold bloc clinging to parity

6. 1934-1948: the interwar and World War II and immediate post war managed gold standard, in a fragmented international monetary system
7. 1948-1968: the Bretton Woods dollar/gold standard system, with progressive dilution of the gold restraints on U.S. monetary conduct
8. 1968-1973: the breakdown of the Bretton Woods system
9. 1973-1981: the United States on an inconvertible paper dollar standard.

U.S. Experience on the Gold Standard

1. 1834-61 -- a de facto gold standard

Before 1879, the United States was legally on a bimetallic standard, but from 1834 on until the Civil War suspension of specie payments, de facto it was on the gold standard. The Mint ratio established by the Coinage Act of 1792 made the dollar equivalent to 24.75 grains of fine gold and to 371.25 grains of fine silver, or a ratio of 15 to 1.¹ The Mint ratio at that time matched the market ratio. Subsequently, a great increase in Mexican and South American silver output led to a decline in the market value of silver relative to that of gold, the ratio approximating 15 $\frac{1}{2}$ to 1. Hence silver was overvalued at the Mint and relatively little gold was brought there. Instead, gold was shipped abroad where the price was higher. De facto during the period before 1834, the

United States was on a silver standard.²

On June 28, 1834, the Coinage Act of 1834 changed the Mint ratio to 16.002 to 1, lessening the gold weight of a dollar to 23.2 grains of fine gold and leaving unchanged the silver weight of a dollar.³ Before 1834, 100 ounces of pure gold or 1500 ounces of pure silver in coin would discharge a debt. After 1834, the debt could be paid with 94 ounces of pure gold in coin. But since silver was undervalued at the Mint, it was driven from circulation. Offering 1475.5 ounces of silver was sufficient at the market ratio to obtain 94 ounces of gold. The Coinage Act in effect debased the currency. Some supporters of the Act were aware that it would drive silver out of circulation. It was indeed their objective to achieve a gold standard and a permanent circulation of gold coins. Others urged that as the market value of silver relative to gold had been falling for many years before 1834, it would continue to do so in the future and therefore the Mint undervaluation of the metal would soon be eliminated. That prediction was wrong.⁴

The Act of 1834 was supplemented in 1837 by a law changing the proportion of alloy to pure metal in gold to correspond to that in silver. It established the ratio of alloy at one-tenth, changing the quantity of pure gold from 23.2 to 23.22 grains.⁵ For each dollar weight in gold, there is a corresponding price of gold per fine troy ounce of 480 grains ($480/23.22 = \$20.67$). The Mint ratio between silver and gold coins became 15.98 to 1 ($371.25/23.22$).

The gold discoveries in Russia, Australia, and California from 1848 on produced a fall in the market value of gold, accentuating the discrepancy

between the Mint and the market ratios. By 1851, a silver dollar was worth about 104 cents of a gold coin, so no one would use silver in settlement of debts. Silver was used as a commodity, not as money.⁶ Since subsidiary silver coinage was proportional to the weight of the dollar piece, it also disappeared from circulation. By 1850, there was a gold standard without adequate subsidiary money for retail transactions. The demonetization of silver may be dated from the Act of February 21, 1853, rather than the customary date of 1873. The Act reduced the number of grains of pure silver in 100 cents from 371.25 to 345.6, a reduction of nearly 7 per cent which exceeded the difference between the value of the gold dollar and silver dollar.⁷ The market value of the pure silver in subsidiary silver coins was thus less than the gold dollar (first minted in 1849; before then, only larger denominations had been coined).⁸ The face value of subsidiary coins accordingly was greater than their value in bullion. The supply of subsidiary coins was left to the discretion of the Secretary of the Treasury, and their legal tender limited to a sum not exceeding five dollars. The Act also for the first time imposed a charge for seigniorage, which until then had been an expense borne by the Government, although subsidiary coins were not subject to seigniorage. (The Resumption Act of 1875 repealed the charge.)⁹

The overvaluation of gold at the Mint that made the dollar a gold currency, when the United States was legally on a bimetallic standard, was reinforced by the gold discoveries after 1848. In France, also legally on a bimetallic standard from 1803 on, the circulation was almost exclusively silver since the market ratio was higher than the Mint ratio of $15\frac{1}{2}$ to 1.

When the gold discoveries after 1848 depressed the value of gold, as in the case of the United States, the divergence between the Mint and market ratios served to shift the franc to a gold standard de facto.¹⁰ Only Great Britain was on a full-fledged gold standard during the period after 1821, when convertibility was restored after the Napoleonic Wars. Since Great Britain was the world's leading trading country and the London money market was the hub of international capital movements, the gold standard had international scope despite the limited number of countries formally adhering to it.

External and internal shocks interacted during the decade beginning 1834, resulting in a highly unstable performance by the U.S. economy. The chief external shock was British in origin. British eagerness to invest in the United States in the early 1830s necessitated a U.S. trade deficit, made possible by a rise in U.S. prices above those prevailing in Britain. Thanks to an inflow of specie into U.S. bank reserves, the money supply expanded, causing U.S. prices to rise. (It is not clear that Andrew Jackson's war on the Second Bank of the United States had any independent consequences for monetary expansion.) Ultimately, loss of specie by the Bank of England led it in 1836 to restrain the capital outflow to the U.S. It raised the discount rate in July and August, refused to discount bills of exchange drawn on mercantile houses engaged in the Anglo-American trade, even at the higher rates, and as a result, produced financial pressure in the United States by early 1837.¹¹

Simultaneously with the earlier capital outflow from Britain, a surge in British demand for U.S. raw cotton triggered a land boom. Between 1833 and

1836, land sales by the Federal Government at a constant price sextupled. News of the Specie Circular in July 1836, requiring payments to land agents in specie, concerned the Bank of England because of the implied rise in the demand for specie in the United States. Domestically, the planned distribution to the states in four equal installments (only three took place) of the surplus accumulated by the Federal Government from its land sales, starting January 1, 1837, might also have imposed a hardship on the banks as funds were transferred from one institution to another.¹²

Financial pressure in the United States in early 1837 was aggravated by a fall in the price of cotton, as British demand declined. As a result, debts secured by cotton became frozen, merchants holding such debts went bankrupt, and banks with such loans in their portfolios suspended specie payments as an alternative to the repayment of debts to Britain at a fixed exchange rate. In effect, the United States devalued the dollar during the period of suspension when foreign exchange was available only at a premium.¹³

The suspension continued for a year. In 1838, the economy revived when Britain resumed capital exports, but in 1839, loss of specie again prompted the Bank of England to raise the discount rate. As in 1837, both the supply of capital to the United States and the demand for its cotton fell. The successor Pennsylvania-chartered Bank of the United States, which had extended loans on cotton when the price was high, suspended specie payments in October 1839, followed by banks in the South and West. Nine states defaulted on their bonded indebtedness in 1841 and 1842, shutting off further capital inflows from Europe until the 1850s. Bank failures were

widespread, the supply of money fell sharply, and deflation ruled, 1839-43.

Banking panics also occurred in 1847 and 1857, but only the latter one was accompanied by restrictions on convertibility and a premium on gold.¹⁴

Gold standard experience of the United States before the Civil War was dominated by the role of the Bank of England. The standard imposed real adjustment costs on this country. External shocks produced boom and depression that further amplified the effects of internal shocks. Adjustment costs were the price the United States paid for maintaining a fixed exchange rate with sterling. When the costs became excessive, specie payments were suspended.

The record of the quarter-century from 1834 on reveals the magnitude of the adjustment costs. Wholesale prices at annual rates varied as follows:¹⁵

1834-37 (+8 percent); 1837-43 (-7 percent); 1843-47 (+5 percent); 1847-49 (-5 percent); 1849-55 (+5 percent); 1855-61 (-4 percent).

The estimates of real output for the period 1834-59 are not continuous with the post-Civil War estimates.¹⁶ At annual rates, they also suggest not much greater stability than in wholesale prices:

1834-36 (-1 percent); 1836-39 (+6 percent); 1839-40 (-1 percent); 1840-53 (+6 percent); 1853-54 (-4 percent); 1854-59 (+4 percent).

2. 1862-1878 -- the greenback standard¹⁷

Early in 1862, convertibility of Union currency into gold was suspended as a result of money creation in the North to help finance the Civil War, disturbances in foreign trade, the general uncertainty arising out of the war, and the borrowing techniques of the Treasury. From then until

resumption of specie payments on January 1, 1879, the United States was legally on a fiduciary standard -- the greenback standard. Despite support for inconvertible currency by many business groups before and during the war, and growing farm support after the war, as agricultural prices fell, suspension of payments was generally regarded as temporary.

During suspension, greenbacks circulated side by side with gold, with the price of gold in terms of greenbacks varying from day to day. A floating rate of exchange existed between the two currencies. The major monetary use of gold was for foreign transactions. For foreign payments, gold was equivalent to foreign exchange, since Great Britain in particular maintained a gold standard. Dealers as well as others having extensive foreign transactions therefore found it convenient to maintain gold balances as well as greenback balances. To accommodate them, New York banks, and perhaps others as well, had two kinds of deposit accounts: the usual deposits payable in greenbacks or their equivalent, and special deposits payable in gold. The gold deposits were expressed in "dollars" like the greenback deposits, but the dollar stood for the physical amount of gold that had corresponded to a dollar before the Civil War and was to again after 1879. During the period of suspension, this physical amount of gold was worth more than a dollar in greenbacks -- it was worth well over two dollars in greenbacks from mid-1864 to early 1865.

Gold also retained an appreciable, though minor role, in domestic payments. Customs duties were payable in gold. In addition, the Treasury made virtually all interest and principal payments on its debt in gold at the pre-Civil War monetary value. Some private debt instruments required

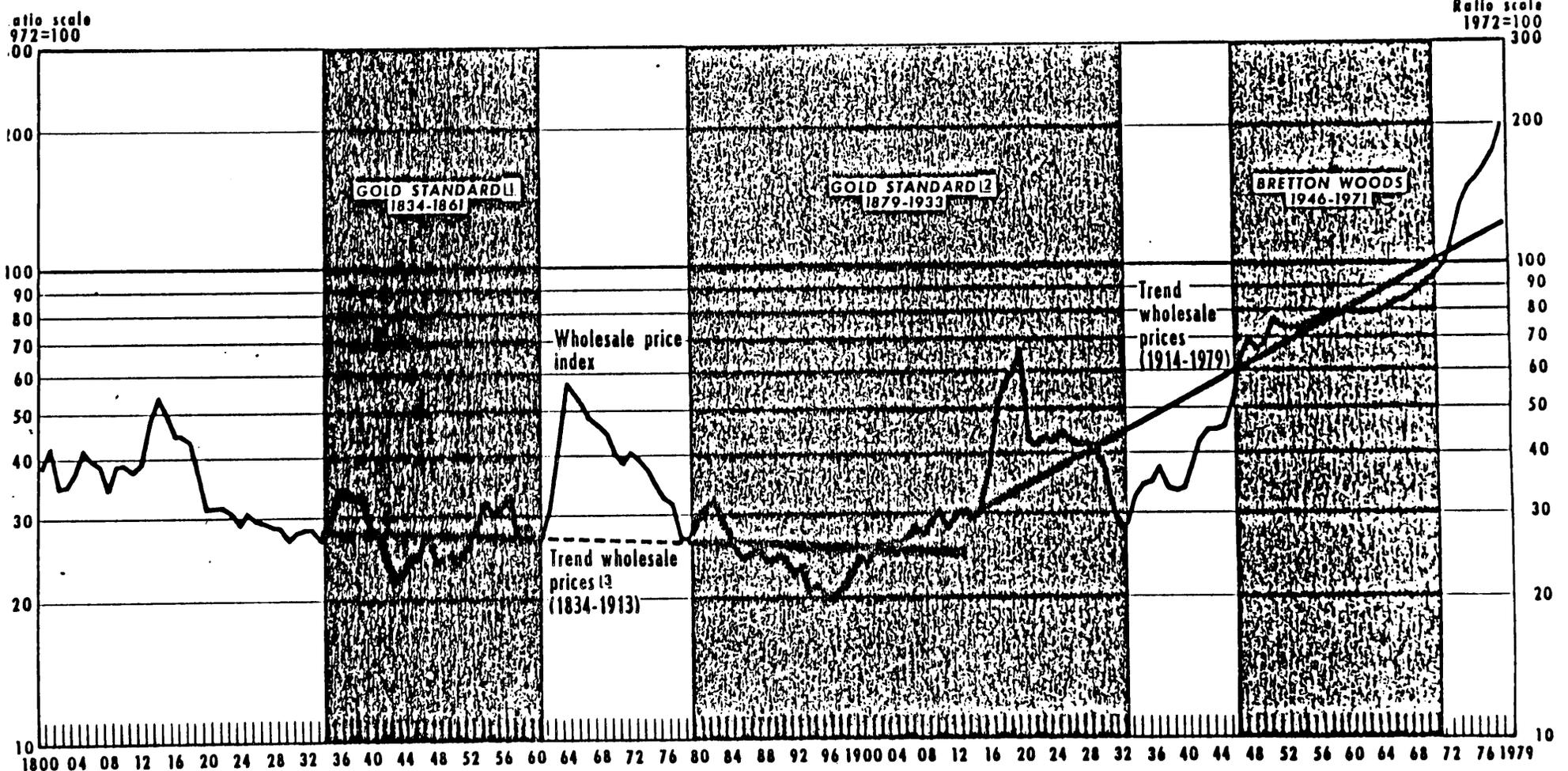
payment of interest or principal in gold. Finally, the West Coast remained largely on a specie basis. In the rest of the country, prices were quoted in greenbacks, and gold offered in payment was valued at its current market premium in greenbacks. On the West Coast, by contrast, prices were quoted in gold, at the prewar parity, and greenbacks offered in payment were valued at their current market discount in gold.

Before the Civil War, the exchange rate between the U.S. dollar and the British pound varied around \$4.86 within a narrow interval determined by the costs of shipping gold. From 1862 on, the exchange rate was not so limited and moved far outside those limits. It was determined by the demand for and supply of foreign exchange, and there were no legal commitments on the part of the United States that prevented the exchange rate from taking any value that was necessary to balance international payments.

The essential requirement for a return to the prewar parity was that the exchange rate so determined be within the initial range determined by the gold points. Once the Civil War was over, the most important factor affecting the exchange rate between the U.S. dollar and the British pound was the movement of internal prices in the United States relative to prices in Britain. A drastic decline in U.S. prices between 1867 and January 1879 made resumption possible. The price index fell at the rate of 5.4 percent per year (see Figure 2-1). Over the same period, the quantity of money rose at the rate of 1.3 percent per year. An exceedingly rapid rise in output was the primary factor producing the decline in prices.

Specie resumption was a major political objective of the period and the

Figure 2-1
Wholesale Price Index, United States



1 Excludes 1838-1843 when specie payments were suspended
 2 United States imposes gold export embargo from September 1917 to June 1919
 3 Broken line indicates years excluded in computing trend.

Prepared by Federal Reserve Bank of St. Louis

question whether the government was proceeding toward this objective too rapidly or too slowly was a major political issue. Government action played a minor, if crucial, supporting role in contributing to successful resumption. It may have contributed to the rapid expansion of output through its policies on sale of public land, land grants to railroads, and other similar measures which contributed to the expansion of the West. But such government action was not of the kind that anyone at the time or since would have regarded as explicitly directed toward achieving resumption.

Government action had mixed effects on the mild rate of growth of the quantity of money outstanding. On the one hand, federal and state legislation laid the foundation for the rapid growth of commercial banking, particularly state banks after 1867, that produced increases in the ratios of deposits to reserves and deposits to currency. In addition, the elimination of reserve requirements against national bank notes in 1874 liberated reserves that encouraged a rise in the deposit-reserve ratio. The rises in the deposit ratios tended to increase the quantity of money outstanding, and thereby to inhibit price declines and to postpone the achievement of the prerequisites for successful resumption. On the other hand, the government did succeed in bringing about a minor reduction in the stock of high-powered money, mostly through use of government surpluses and debt refunding operations to retire Civil War currency issues from 1865 to 1869, and it thereby helped offset to a limited extent the effect of the rises in the deposit ratios.

In view of the recurrent political pressures to expand the greenback issues -- to which the government in fact yielded in 1873-74 following the

banking panic of 1873 and the subsequent business contraction -- and the political difficulty then as now of obtaining budget surpluses to retire debt, the achievement of even a minor decline in high-powered money was not a negligible accomplishment.

The Resumption Act of January 14, 1875, which announced the intention to resume specie payments at the prewar parity on January 1, 1879, contained a variety of provisions designed to appeal to silver advocates (replacement of fractional currency --a Civil War paper issue -- by silver coins); paper-money advocates (removal of existing limits on the aggregate issue of national bank notes and linking the retirement of greenbacks --the aggregate outstanding not to fall below \$300 million -- to the increase in national banknotes; for every five dollar increase in national bank notes the Treasury was to retire four dollars in greenbacks); gold standard advocates (its main provisions). The Act authorized the Secretary of the Treasury both to use surplus revenue and to sell bonds in order to accumulate a gold reserve. At the time, the Act was little more than the expression of a pious hope and, insofar as it had any contemporary effect, it was to heighten the opposition to resumption.

That opposition was reflected in the free silver movement that arose in the mid-1870s. The Monetary Commission that was formed late in 1876 by a joint resolution of the Congress presented a year later one majority and two minority reports. The majority argued against resumption as "not practicable under the circumstances, until the laws making gold the sole metallic legal tender are repealed." Some of the majority recommended the old silver dollar of 412.5 standard (equivalent to 371.25 grains of fine

silver) grains; the rest recommended a legal relationship between silver and gold of 15.5 to 1 instead of the old relationship of 15.98 to 1, achievable either by reducing the silver content of the silver dollar to 399.9 grains or by increasing the gold content of the gold dollar. They favored the former inflationary effect. One minority report rejected silver as unsuitable for a standard of value but recommended devaluation of the gold dollar by about 2.6 per cent. The second minority report supported the principle of silver remonetization only on condition that an international conference would accept silver as a universal legal tender.¹⁸ There was clearly a range of views on the proper monetary standard, with some diehard attitudes toward resumption at the pre-Civil War parity. Late in 1877, the House passed a bill to repeal the Resumption Act. The bill was defeated in the Senate by one vote. This paper-thin decision turned out to be politically decisive.

The decline in the quantity of money in the last few years before resumption, which helped foster the particularly rapid price decline of those years, in part owed something to the decline in the two deposit ratios associated with bank suspensions in 1877-78, in part to the influence of the Resumption Act. The clause in the Resumption Act requiring a withdrawal of \$4 of greenbacks for every \$5 of new national bank notes was interpreted in a manner that served to contract total circulation. The failure to deduct the voluntary surrender of national bank notes issued by banks retiring their notes from the gross increase of national bank notes by other banks effectively reduced outstanding note issues.¹⁹

Both before and immediately after resumption, the Treasury in its refunding operations went to great lengths to avoid the introduction of even temporary disturbances of any magnitude in the foreign exchange market. In 1877-79, the Treasury refunded about half the average outstanding interest-bearing public debt, to take advantage of lower rates of interest. For foreign holders of securities, calls of old bonds were so timed that one collection of securities was replaced by another or, if offsetting sales of new bonds were not possible, surplus from current account was available to pay for old bonds retired without export of U.S. gold. During these years, in fact, the United States was a net importer of over \$5 million in gold, despite a repatriation of over \$300 million of U.S. government securities by foreigners.

The Resumption Act, and the borrowing and accumulation of a specie reserve under its provisions, had three effects, working in different directions, on resumption.

1. Insofar as the Act and the specie reserve instilled confidence in the prospective maintenance of specie payments, it inhibited either a speculative withdrawal of funds from the United States or a speculative accumulation of specie, and enhanced the willingness of foreigners to hold U.S. dollar balances. Had there been no Resumption Act, repatriation by foreigners of U.S. securities in 1876-78 might well have been even greater than it was. More important, by setting a definite exchange rate that was to be attained and a definite date at which it was to be attained, the Act offered those speculators with confidence that the government would in fact succeed in achieving those aims an incentive to proceed so as to hold it

there. In fact, the monthly average premium on gold dropped below 2 per cent by March 1878 and never thereafter rose above that level. This effect clearly favored resumption.

2. The sale of bonds was an open market operation. The sale of bonds at home for gold was equivalent to selling bonds for greenbacks and then using the proceeds to purchase gold, with the effect of an open market purchase combined with an equivalent open market sale, the two together leaving the total monetary base unaffected. In practice, though gold was not the legal standard, it was used for monetary purposes alongside greenbacks. In consequence, insofar as the gold purchased came from gold held for monetary purposes by either the domestic public or the domestic banks, it did, in the first instance, reduce the reserve basis of the system. However, the banks and others could always replace gold holdings, if they so wished, by purchasing gold or its equivalent, sterling, in the free market at home or abroad and, in fact, that is what happened. The increase in the Treasury's gold reserves was not appreciably at the expense of the high-powered money holdings of the public or the banks. This effect was essentially neutral with respect to the growth of high-powered money.

3. Since gold was the equivalent of foreign exchange, the Treasury's purchase of gold constituted an increase in the demand for foreign exchange. Insofar as it borrowed abroad resources that would otherwise not have been available for loans to this country, it increased the supply correspondingly. But some of its borrowing abroad must have been at the expense of other lending to this country (lending was going on even though the net capital movement from this country was outward); to that extent,

the supply was increased less than the demand even by foreign borrowing. Borrowing at home had this effect to an even greater extent. By borrowing at home, the Treasury acquired resources that would have been used in other ways, some of which might have involved a demand for foreign exchange. At most, however, only part of the resources would have been used to purchase foreign exchange, whereas the Treasury used all of them in this way. The result of the greater increase in demand than in supply was to make the greenback price of sterling higher than it otherwise would have been. The effect therefore made resumption more difficult; it required, that is, a decline in domestic prices sufficient not only to balance foreign payments on current account at the desired exchange rate but also to produce a large enough balance of payments surplus to finance the accumulation of the specie reserve. Whether the Resumption Act on balance hindered or helped resumption therefore depends on whether this effect was more or less important than the effects on confidence and speculation, and on the growth of high-powered money.

Whatever the conclusion on this score, the cessation of government borrowing to build up a gold reserve, once resumption had taken place, removed a source of pressure on the exchange rate and permitted domestic prices to rise sharply immediately after resumption, without producing balance-of-payment problems.

3. 1879-1914 -- a gold standard without a central bank²⁰

The success of resumption did not end uncertainty about the monetary standard. For nearly two decades thereafter, the U.S. financial scene was dominated by controversy, which had started in the seventies, over the

place of silver in the monetary system.

The rapid expansion of output in the Western world during those decades and the adoption of a gold standard over an area far wider than before added substantially to the demand for gold for monetary purposes at any given price level in terms of gold. That expansion in demand more than offset a contemporary expansion in supply, as a result both of increased production of gold and improvement of financial techniques in erecting a larger superstructure of money on a given base of gold. The result was a slow but rather steady downward tendency in product prices that prolonged and exacerbated the political discontent initiated by the rapid decline in prices after the end of the Civil War. "Greenbackism" and "free silver" became the rallying cries. The silver forces were strong enough to obtain concessions that shook confidence in the maintenance of the gold standard, yet they were not strong enough to obtain the substitution of silver for gold as the monetary standard. The monetary history of this period is therefore one of repeated crises and of legislative backing and filling.

The political campaign of 1896 on these issues was conducted with notorious bitterness involving both class and sectional conflicts. Fear and smear techniques were used freely on all sides. The free-silver advocates succeeded in capturing Democratic state conventions and in maneuvering the adoption of a free-silver plank in the Democratic national convention, which chose William Jennings Bryan as candidate. The National Silver party and the People's party -- an agrarian party -- deflected from its extensive reform program by the hope of victory on the silver issue, also nominated Bryan. A conservative Democratic group seceded, held an

independent convention, and nominated its own candidate (John M. Palmer). The Republican party nominated McKinley who was persuaded to accept along with the nomination a platform favoring the gold standard until "international agreement with the leading commercial nations of the earth . . . can be obtained" for coining gold and silver at a fixed ratio. A rump group seceded from that convention and went over to the Democrats.

The election was won by the Republicans, largely, it has been claimed, because the farm vote swung to the party as a result of the rise in price and quantity of farm-product exports during the fall of 1896. Once the party was in power, Republican political action for monetary reform was restrained. Bryan's strength at the polls, however, compelled the Republicans to keep a campaign promise to propose another international conference in Europe to remonetize silver. The defeat of the silver inflationists had improved the United States' bargaining position, but by that time, rising gold output had snatched from the silver advocates the chance of achieving an international bimetallic standard. Not until March 14, 1900, however, was the Gold Standard Act passed. It declared the gold dollar to be the monetary standard of the country and prescribed a reserve of \$150 million in the Treasury for the redemption of paper money.

The defeat of William Jennings Bryan in the Presidential election of 1896 marks in retrospect the end of the period. His defeat hapened to follow gold discoveries in South Africa and Alaska and the perfection of the cyanide process for extracting gold. These developments produced a rapid expansion of the world's production of gold. Bryan's second defeat in the Presidential election of 1900 sealed the doom of silver as a major

issue dominating national politics. The gold standard had finally triumphed in the United States. The price reversal, which farmers had sought to achieve with silver, was produced after 1897 by the prodigious increase in the international supply of monetary gold. It was sufficiently large to force an upward price movement over the next two decades despite a continued growth in world output. The "money" issue retreated from the center of political controversy. The gradual rise in prices rendered the gold standard secure and unquestioned in the United States until World War I.

Monetary disturbances during the period from 1879 to 1914 were associated with banking difficulties in 1884, 1890, 1893, and 1907. Under a fractional reserve banking system, the public's withdrawal of currency from the banks not only reduced the banks' reserves but also produced a multiple contraction in deposits. In some episodes, as in the period 1834-1861, the banks restricted convertibility of deposits into currency. As a consequence, currency sold at a premium, which was equivalent to a depreciation of the deposit dollar in terms of gold or foreign exchange. These monetary disturbances, however, were attributable to the U.S. banking structure rather than the gold standard system, as was clear from the case of banking difficulties in 1873. The need for reform of the banking structure was widely acknowledged after 1907.

To form a judgment about U.S. experience under the gold standard, we can examine the behavior of prices and real per capita output (Figures 2-1 and 2-2), and of the monetary gold stock and the purchasing power of gold (Figure 2-3). The trend of the wholesale price index for the period

FIGURE 2-2

PER CAPITA REAL INCOME (IN 1972 DOLLARS)

- TREND 1869-1980
- X PER CAPITA REAL INCOME 1869-1980

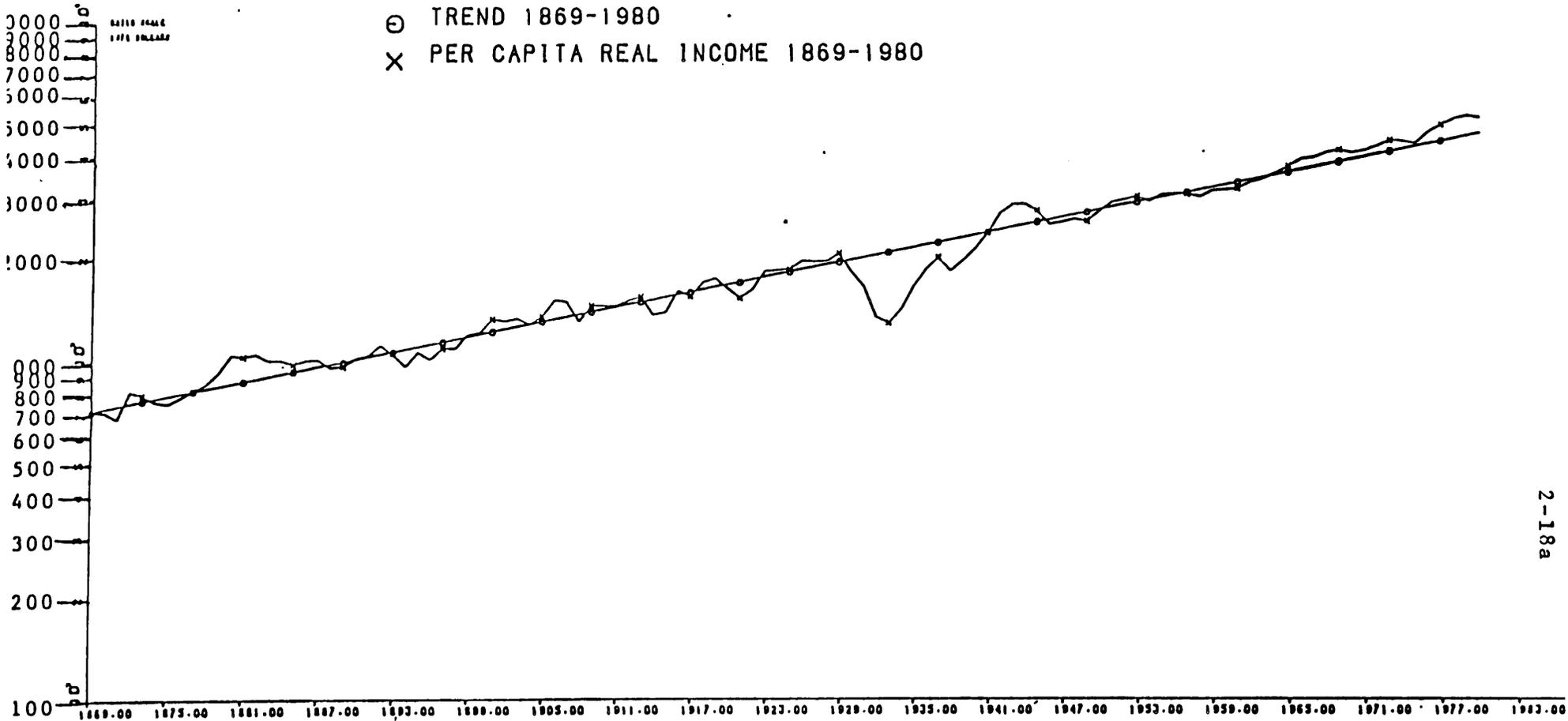
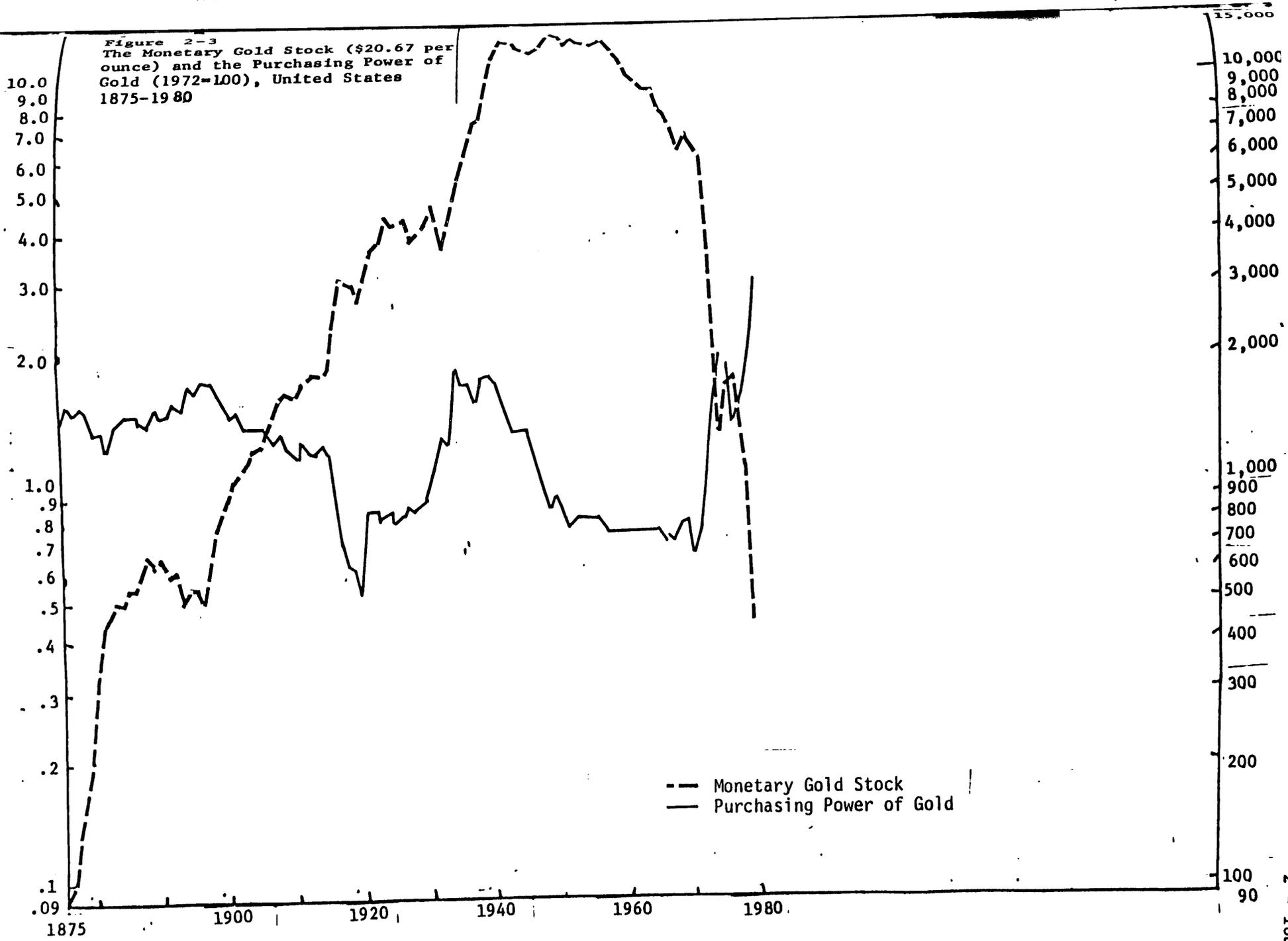


Figure 2-3
The Monetary Gold Stock (\$20.67 per ounce) and the Purchasing Power of Gold (1972=100), United States 1875-1980



-- Monetary Gold Stock
— Purchasing Power of Gold

1834-61 and 1879-1914 was slightly downward, with a marked degree of variance about the trend.²¹ Despite a sharp decline in the annual estimates from 1890 to 1896, the trend of the U.S. monetary gold stock was positive from 1879 to 1914.²² The trend of the purchasing power of gold was positive (a falling price level) from 1879 to 1896, negative (a rising price level) from 1897 to 1914, reflecting the more rapid growth in U.S. monetary gold than in real output in the later period. Deviations from trend in the monetary gold stock were negatively associated with deviations from trend in the purchasing power of gold, with some tendency for the purchasing power deviations to lead the monetary gold stock deviations. This would be consistent with a tendency for the price level to revert towards a long-run stable value under the pre-World War I gold standard, though over the short run inflation or deflation was experienced.

As might be expected, the trend of U.S. real per capita income was strongly positive from 1879 to 1914, but with substantial variance about the trend.²³

In sum, contemporaries regarded the pre-World War I gold standard as a successful commodity standard, international in scope from the late nineteenth century on. It provided long-run stability despite short-term price instability. Years might elapse before a tendency to decline or rise in the price level was reversed. Real output growth around a rising trend was not steady but the instability was attributed to special features of the U.S. banking structure.

Relative to Great Britain, the United States was only a small country in the world economy. The Bank of England dominated the world economy,

influencing international flows of capital, managing the gold standard on a narrow gold base, so that the rest of the world had to keep in step with its actions. With the monetary systems of many countries linked together through fixed exchange rates, international payments imbalances led to movements in money supplies, price levels, the relative prices of exports and imports, incomes and interest rates.

The extent to which these results were due to relative international peace, relatively free international trade, factor mobility within and across countries, the concentration of world capital and money markets in London, and the willingness of gold standard countries to maintain fixed parities can be judged by comparison with the absence of these conditions in the post-World War I decades.

4. 1914-1933 -- a managed gold standard²⁴

The Federal Reserve Act was passed in 1913 under peacetime conditions when it was taken for granted that the gold standard would prevail. The Act included a gold standard rule incorporated in gold reserve requirements for Federal Reserve notes and deposits and also a "real bills" rule, according to which the criterion for determining the quantity of money would be linked to "notes, drafts, and bills of exchange arising out of actual commercial transactions" (section 13), offered for discount at rates to be established "with a view of accommodating commerce and business" (section 14d). Both were regarded as quasi-automatic in their operation. Taken literally, the two rules were contradictory. Maintenance of the gold standard means that the stock of money must be whatever is necessary to balance international payments. The real bills rule sets no effective

limit to the quantity of money.

The Act was no sooner passed than the conditions taken for granted ceased to hold. Before the System began operations in November 1914, World War I had begun. Very soon the belligerents effectively left the gold standard and a flood of gold started coming to the United States to pay for purchases by the Allies. Between September 1917 and June 1919 the United States controlled gold exports by export licenses and in effect suspended interconvertibility between paper money and gold. The gold standard criterion set a largely ineffective limit on the total quantity of money.. A worldwide gold standard was re-established for a brief period in the 1920s, yet the gold standard never again played the role that the framers of the Act took for granted. The real bills criterion fared no better. Once the United States entered the war, loans on government securities began to rival commercial paper as collateral for Reserve Bank rediscounts. The Reserve System was authorized to issue notes against rediscounted assets other than commercial paper, mainly members' 15-day notes secured by government bonds. Thus the Federal Reserve System began operations with no effective legislative criterion for determining the quantity of money.

This conclusion can be documented by comparing the actual course of events with what would have happened under a fully operative gold standard. The wartime experience under a gold standard might not have differed from what actually occurred: the large inflow of gold up to the entry of the United States into the war would have produced a price rise through 1918 similar to actual experience. The big difference would have emerged between the end of the war and 1920 when nearly half of the monetary

expansion from 1914 on occurred because the Federal Reserve subordinated monetary policy to the alleged necessity for facilitating Treasury funding of the floating debt plus unwillingness to see a decline in the prices of government bonds. The monetary expansion and the accompanying inflation led to an outflow of gold after the lifting of the embargo despite the great demand abroad for U.S. exports and despite the departure of most countries from a fixed parity between their currencies and either gold or the dollar. The ensuing decline in the reserve ratio of the Federal Reserve System finally compelled action to slacken monetary growth. The initial action -- a sharp rise in discount rates in January 1920 -- produced a reversal of the gold outflow in May. The following action -- a second rise in discount in June 1920 rates to the highest level in Federal Reserve history until 1973 -- was a deliberate act of policy involving a reaction stronger than was needed, since a gold inflow had already begun. It was succeeded by a heavy gold inflow and a negative rate of monetary growth over the following year, as both bills discounted by the Federal Reserve and its portfolio of government securities were sharply reduced. Wholesale prices were nearly halved by June 1921 from their level in May 1920. Real output fell precipitously.

The postwar increase in the quantity of money occurred because the Reserve System did not observe the rules of the gold standard but exercised discretion. The subsequent collapse occurred because the power to manage money was not limited by the requirement to maintain gold reserve requirements. Had there been no discretion, neither the postwar increase, nor the postwar collapse need have occurred. Other things equal, the

conversion from a wartime to a peacetime economy would likely have lowered temporarily the level of economic activity, but the Federal Reserve exacerbated the severity of the contraction.

The price and output movements of the post-World War I years in this country were part of a worldwide movement. Throughout most of the world, for victors, vanquished, and neutral alike, prices rose sharply before or into 1920 and fell sharply thereafter. About the only countries that escaped the price decline were those that were to experience hyperinflation. Though many national currencies were not rigidly tied either to gold or to the dollar, central bank policies nevertheless produced linkages sufficiently strong to result in common movements of prices in most national currencies. Flexible exchange rates were regarded as a temporary expedient pending return to gold, and monetary authorities everywhere sought to facilitate such a return to fixed parities. The results under managed fiduciary currencies were therefore similar to those that would have been experienced with fixed parities.

During the balance of the 1920s, the Federal Reserve System did not permit gold movements to affect the quantity of money outstanding. Inflows were offset by open market sales of government securities, outflows, by open market purchases. Federal Reserve credit after 1923 moved inversely with movements in the gold stock. The System achieved stable economic growth with falling wholesale prices, but this achievement was largely at the expense of economic stability in Great Britain and the peripheral countries tied to sterling. Britain's return to gold in 1925 at a parity that overvalued sterling would have caused her less difficulty if prices in

the United States had risen instead of falling thereafter. The United States would then have gained less gold or lost some, and the pressure on the pound would have been eased. When France returned to gold in 1928 at a parity that undervalued the franc and also did not permit gold inflows to affect its money stock and prices, the British position was further undermined.

The monetary standard to which most countries had returned by 1929 was the gold-exchange standard. They kept their monetary reserves in the form of balances of other currencies convertible into gold at fixed prices, notably sterling and dollars, rather than in the form of gold itself. Official agencies in such countries, usually the central banks, often fixed exchange rates directly by standing ready to buy or sell the national currency at fixed rates in terms of other currencies, rather than indirectly by standing ready to buy or sell gold at fixed prices in terms of the national currency.

Since the gold-exchange standard, like the gold standard, involved fixed exchange rates, it also meant that, so long as the standard was maintained, prices and incomes in different countries were intimately connected. They had to behave so as to preserve a rough equilibrium in the balance of payments among countries. The gold-exchange standard, however, made the international financial system more vulnerable to disturbances because it raised the ratio of claims to gold available to meet those claims.

The links forged by fixed rates of exchange ensured a worldwide decline in income and prices after 1929. As is well known, shocks in one country's

income, employment, and prices, tend to be transmitted to income, employment, and prices of its trading partners under a fixed exchange rate system. The evidence is clear that the United States was in the van of the movement and not a follower. If declines elsewhere were being transmitted to the United States, the transmission mechanism would be a balance of payments deficit in the United States as a result of a decline in prices and incomes elsewhere relative to prices and incomes in the United States. That decline would lead to a gold outflow from the United States which, in turn, would tend -- if the United States followed gold-standard rules -- to lower the stock of money and thereby income and prices in the United States. However, the U.S. gold stock rose during the first two years of the 1929-33 contraction and did not decline, demonstrating that other countries were being forced to adapt to our monetary policies rather than the reverse.

The international effects were severe and the transmission rapid, not only because the gold-exchange standard had rendered the international financial system more vulnerable to disturbances, but also because the United States did not follow gold-standard rules. The Federal Reserve did not permit the inflow of gold to expand the U.S. money stock. It not only sterilized it, it went much further. The U.S. quantity of money moved perversely, going down as the gold stock went up. In August 1929, at the start of the business contraction, the U.S. quantity of money was 10.6 times the gold stock; by August 1931, it was 8.3 times the gold stock. The result was that other countries not only had to bear the whole burden of adjustment but also were faced with continued additional disturbances in

the same direction, to which they had to adjust.

The effects first became severe in those countries that had returned to gold with the smallest actual gold reserves, and whose financial structure had been most seriously weakened by World War I -- Austria, Germany, Hungary, and Rumania. To shore up the financial systems of those countries, international loans, in which the Reserve System participated, were arranged. But so long as either the basic pressure on those countries deriving from deflation in the United States was not relieved, or the fixed-exchange rate link which bound them to the U.S. dollar was not severed, such assistance was at best a temporary palliative. In country after country, that is what it proved to be. As they experienced financial difficulties, the United States was in turn affected by the reflex influence of the events it had set in train.

The first major country to cut the link was Britain, after runs on sterling precipitated by France and the Netherlands. Britain abandoned the gold standard in September 1931. The international monetary system split in two, one part following Britain to form the sterling area; the other following the United States, in the gold bloc. The trough of the depression in Britain and in other countries that accompanied Britain in leaving gold was reached in the third quarter of 1932.

In the two weeks following Britain's departure from gold, central banks and private holders in a number of foreign countries converted substantial amounts of their dollar assets in the New York money market to gold. The U.S. gold stock declined by the end of October to about its level in 1929. The Federal Reserve System, which had not responded to an internal drain

from December 1930 to September 1931 as a series of runs on banks, bank failures, and shifts from bank deposits to currency by anxious depositors produced downward pressure on the U.S. quantity of money, responded vigorously to the external drain. A sharp rise in discount rates ended the gold drain temporarily but intensified bank failures and runs on banks. In 1931, unlike the situation in 1920, the System's reserve ratio was far above its legal minimum. The System overreacted to the gold outflow and magnified the internal drain.

The Federal Reserve System justified its passivity in relation to the internal drain by reason of a shortage of free gold. The law specified that the System hold against Federal Reserve notes outstanding, the volume of which had increased with the internal drain, a reserve of 40 percent in gold and additional collateral of 60 percent in either gold or eligible paper (which consisted of commercial, agricultural, or industrial loans, or loans secured by U.S. government securities rediscounted by member banks; loans to member banks secured by paper eligible for rediscount or by government securities; and bankers' acceptances, i.e., "bills bought" in Federal Reserve accounting terminology). Because the System did not have enough eligible paper to furnish 60 percent of the collateral for Federal Reserve notes, part of the gold in excess of minimum requirements had to be pledged for this purpose. The amount of gold not needed to meet either minimum gold requirements or collateral requirements was therefore less than the amount of excess gold reserves. The Federal Reserve System asserted that the shortage of free gold was an important factor preventing the System from engaging in open market purchases. Such purchases would

have reduced eligible paper holdings still further by reducing rediscounts and therefore could have been conducted only to a very limited extent without eliminating free gold entirely. Whatever the validity of the Federal Reserve view, the Glass-Steagall Act of February 27, 1932, disposed of that problem by permitting government bonds in the Reserve Banks' portfolios as well as eligible paper to serve as collateral against Federal Reserve notes in addition to the 40 percent minimum gold reserve.

The downward movement of money, income, and prices in the United States was reversed for a few months in the second quarter of 1932, when the Federal Reserve undertook a program of open market purchase, following which there was a widespread revival in the real economy in the summer and fall. The termination of the program during the summer was followed in the six months from October 1932 by mounting banking difficulties, leading to state banking holidays. By February 1933, fears of a renewed foreign drain added to the general anxiety. For the first time, also, the internal drain partly took the form of a specific demand for gold coin and gold certificates in place of Federal Reserve notes or other currency. The Federal Reserve System reacted as it had in September 1931, raising discount rates in February 1933 in reaction to the external drain but not seeking to counter either the external or internal drain by extensive open market purchases. In the first few days of March, heavy drains of gold, both internal and external, reduced the New York Federal Reserve Bank's reserve percentage below its legal limit. With some reluctance, the Federal Reserve Board suspended reserve requirements for thirty days. On March 4, the Federal Reserve Banks remained closed as did all the leading

exchanges. A nationwide banking holiday was proclaimed after midnight on March 6 by the incoming administration. All banks were closed until March 9 and gold redemption, gold shipments abroad or dealing in foreign exchange were suspended during the bank holiday. The Emergency Banking Act of March 9, 1933, granted the President emergency powers over banking transactions and over foreign exchange dealings and gold and currency movements. The next day, March 10, the President issued an executive order extending the restrictions on gold and foreign exchange dealings beyond the banking holiday proper and, in effect, prohibiting gold payments by banking and nonbanking institutions alike, unless permitted by the Secretary of the Treasury under license. These measures were the precursors to a far-reaching alteration in the legal structure of the monetary standard.

5. 1933-1934 -- a floating dollar²⁵

Despite the effective suspension of gold payments in March 1933, the price of gold or the rate of exchange between the dollar and currencies that remained rigidly linked to gold, hovered around "par" for over a month. The suspension was regarded as part of the banking emergency and hence expected to be temporary; foreign exchange transactions were strictly controlled and limited; the administration made no official announcement that it proposed to permit the dollar to depreciate or be devalued; and after some weeks, several licenses to export gold were granted. Moreover, the technical gold position was sufficiently strong so that there was little doubt the preceding gold parity could have been maintained if desired; the ratio of the gold stock to the total stock of money was higher than at any time since 1914.

One important step, unprecedented in the United States, was taken during this period. On April 5, an executive order forbade the "hoarding" of gold and required all holders of gold, including member banks of the Federal Reserve System, to deliver their holdings of gold coin, bullion, or certificates to Federal Reserve Banks on or before May 1 except for rare coins, reasonable amounts for use in industry and the arts, and a maximum of \$100 per person in gold coin and gold certificates. The gold coin and gold certificates were exchanged for other currency or deposits at face value, and the bullion was paid for at the legal price of \$20.67 per fine ounce. The "nationalization" of gold outside Federal Reserve Banks was later completed by order of the Secretary of the Treasury, dated December 28, 1933, excepting only rare coins and a few other minor items from the requirement that all gold coin, gold bullion, and gold certificates be delivered to the Treasurer of the United States at face value corresponding to the legal price of \$20.67 per fine ounce. The expiration date for the surrender of gold was later set as January 17, 1934, when the market price of gold was in the neighborhood of \$33 per fine ounce.

An executive order of April 20, 1933, extending and revising the gold embargo, and comments by the President at his news conference the preceding day ended the period of stability in the price of gold. The President made it clear that the administration intended to permit the dollar to depreciate in terms of foreign currencies as a means of achieving a rise in domestic prices. The order applied the restrictions on foreign exchange transactions not only to banks licensed under the executive order of March 10, but also to all persons dealing in foreign exchange. On the same day,

the Thomas amendment to the Agricultural Adjustment Act was offered in Congress. The amendment enacted into law on May 12, and explicitly directed at achieving a price rise through the expansion of the money stock, contained a provision authorizing the President to reduce the gold content of the dollar to as low as 50 per cent of its former weight. The dollar price of gold immediately started rising, which is to say that so also did the dollar price of foreign currencies, including those like the French franc that remained on gold and those like the pound sterling that had gone off gold at an earlier date. In the next three months, the market price of gold rose to \$30 an ounce, and thereafter fluctuated erratically between a low of about \$27 and a high of nearly \$35 until January 30, 1934, when the Gold Reserve Act was passed. During that period, the United States had a floating exchange rate determined in the market from day to day, as in the period from 1862 to 1879. However, there was considerably greater government intervention in the market. On September 8, 1933, an official gold price, to be fixed daily at the estimated world market figure less shipping and insurance cost, was established. The Treasury agreed to buy gold at that price to give American miners a price as high as they could have obtained by export in the absence of the export embargo.

Starting in October, the government intervened actively to raise the price of gold. The Reconstruction Finance Corporation was authorized to buy newly mined domestic gold from October 25 on, and a few days later, through the agency of the Federal Reserve Banks, to buy gold abroad. The purchase price was raised almost daily. For a time, the large-scale RFC purchases abroad made the announced price for newly-mined domestic gold the

effective market price. From the end of November, however, until the end of January 1934, the announced price exceeded the market price abroad.

The aim of the gold policy was to raise the prices of farm products and raw materials. Most farm products and raw materials exported by the United States had a world market, hence the decline in the foreign exchange value of the dollar meant a roughly proportional rise in the dollar price of such commodities as cotton, petroleum products, leaf tobacco, wheat, and similar items.

The decline in the foreign exchange value of the dollar was initially a product of speculative sale of dollars in the expectation of devaluation — a short-term capital outflow. The decline was sustained by shifts in the demand schedules for imports and the supply schedules of exports produced by the cessation of internal deflation. Prices rose in the United States relative to prices in other countries. If the exchange value of the dollar had not fallen, the price rise would have discouraged exports and encouraged imports. These forces were subsequently reinforced by U.S. purchase of gold at home and abroad.

U.S. purchase of gold involved a reduction in the supply of goods for export, since gold is a potential export good, and hence a reduction in the demand for dollars by holders of other currencies (to buy the domestically produced gold). The purchase of foreign gold involved an increase in the demand for goods for import (namely, gold) and hence in the supply of dollars offered in exchange for foreign currencies (to buy foreign gold). The combined effect was to create a potential deficit in the U.S. balance of payments at the former exchange rate. Given a flexible rate, the

potential deficit was closed by a depreciation of the dollar sufficient to generate, through an increase in exports or a decline in imports or a movement of speculative funds, an amount of foreign currencies exceeding the amount demanded for other purposes by enough to pay for the gold.

These effects depended very little on the fact that gold was the commodity purchased. Given a floating exchange rate, essentially the same effects on the dollar prices of internationally traded goods would have followed from the same dollar volume of government purchase of wheat or perfume, or from the economically equivalent program, adopted after World War II, of building up stockpiles of foreign-produced strategic goods. As it was, the use of gold as the vehicle necessarily meant an accumulation of gold, just as the use of wheat or perfume would have meant the accumulation of that commodity.

The choice of gold as the vehicle did have an important effect on the impact of the program on foreign countries. In the first place -- and a corresponding effect would be present for any particular commodity -- the program had a special impact on gold-producing countries. In the second place -- and this effect would be present only for a commodity serving as the basis of a monetary standard -- it had a special impact on gold-standard countries. Being committed to sell gold at a fixed price in terms of their own currency, these countries necessarily experienced pressure on their gold reserves, which in turn necessitated either abandonment of the gold standard or internal deflationary pressure. Those countries were placed in the position of having to adjust downward their whole nominal price level.

The device used to achieve a decline in the exchange value of the dollar -- borrowing funds (through the issue of RFC securities) to purchase gold -- was not unprecedented. The identical device was employed before 1879 but that time for precisely the opposite purpose: to promote a rise in the exchange value of the dollar. As noted above, the mechanical as opposed to the psychological effects of the accumulation of a gold reserve rendered resumption more rather than less difficult.

A major obstacle to using gold as a vehicle for lowering the exchange value of the dollar and thereby raising prices was the existence of the so-called gold clause in many government and private obligations and in private contracts. That clause, whose use dated back to the greenback period after the Civil War, required payment either in gold proper, or in a nominal amount of currency equal to the value of a specified weight of gold. It was designed precisely to protect lenders and others against currency depreciation. This clause, if honored, would have multiplied the nominal obligations of the federal government and of many private borrowers for interest and principal of debt by the ratio of the new price of gold to the old price of gold. Accordingly, a joint resolution was introduced in Congress on May 6, and passed on June 5, 1933, abrogating the gold clause in all public and private contracts, past and future. In February 1935, the Supreme Court, by a five-to-four decision, in effect upheld the constitutionality of that resolution. Not until the act of October 28, 1977, was the prohibition against gold clauses removed, and express allowance for their use provided.

At the outset, the gold policy was one of two mutually inconsistent

policies with respect to the monetary standard simultaneously pursued by President Roosevelt. The other was the organization of a World Monetary and Economic Conference which convened in London, June 1933. President Hoover had set in train the arrangements for the convocation of the conference in May 1932, and it was originally scheduled to be held in January 1933. The aim of the conference was to achieve cooperative action on international economic problems, and hopes were high that it would produce an agreement stabilizing foreign exchange arrangements. But the conference was nearly a complete failure. One reason was that, while it was in process, the President apparently decided definitely to adopt the path of currency depreciation. He sent a message to the conference on July 2, 1933, which disassociated the United States from any attempt to achieve what was described as a "temporary and probably an artificial stability in foreign exchange on the part of a few large countries" and was termed a "specious fallacy." The message was at the time given much of the public blame for the failure of the conference. However, whatever the President might have said and however consistent U.S. policy might have been, it seems dubious that the economic preconditions existed for a viable exchange stabilization agreement. The fundamental difficulties were the probable incompatibility of the exchange rates of the sterling bloc and of the nations that still remained on gold, and the unwillingness at the time of the gold-bloc countries to change their gold parities.

The period of a variable price for gold came to an end on January 31, 1934, when the President, under the authority of the Gold Reserve Act passed the day before, reduced the gold content of the dollar to 13.71

grains and thus specified a buying and selling price of \$35 an ounce for gold ($480/13.71 = \35). He thereby devalued the gold dollar to 59 per cent of its former weight. Under the terms of the Act, title to all gold coin and bullion was to be vested in the United States; all gold coins were to be withdrawn from circulation and melted into bullion and further gold coinage was to be discontinued; the Secretary of the Treasury was to control all holdings and dealings in gold; and the President was authorized to fix the weight of the gold dollar at any level between 50 and 60 percent of its prior legal weight.

Since the Treasury had formerly valued its own gold holdings at \$20.67 an ounce, and paid only that price for gold it acquired from private individuals, commercial banks, and the Federal Reserve System, it realized a large "paper" profit from the revaluation of the dollar; which is to say, the Treasury could print additional paper money entitled "gold certificates" to a nominal value of nearly \$3 billion without acquiring additional gold and yet conform to the legal requirement that it hold a specified weight of gold (now less than before) for each dollar printed. Those gold certificates could not be legally held by private individuals, but they could be held by Federal Reserve Banks. Accordingly, to realize its "profits," the Treasury had to turn over gold certificates to the Federal Reserve System, receiving in return a deposit credit that it could convert into Federal Reserve notes or pay out by check. Stripped of its legal trappings, the economic effect was identical with a simple grant of authority to the Treasury to print and put in circulation nearly \$3 billion of fiat currency in addition to the \$3 billion in greenbacks already

authorized by the Thomas Amendment to the Agricultural Adjustment Act.

Of the paper profit, \$2 billion was appropriated to a stabilization fund set up under the control of the Secretary of the Treasury, who, with the approval of the President, was authorized to deal in gold, foreign exchange, and such other instruments of credit as he deemed necessary for the purpose of stabilizing the exchange value of the dollar. Of the balance of the paper profit, \$645 million was used for the redemption of national bank notes, which simply substituted one form of fiduciary currency for another; \$27 million was transferred to the Federal Reserve Banks for making industrial loans; \$2 million was charged off to losses in melting gold coin; and \$141 million remained in the General Fund cash balance.

Thus the interlude during which the United States was not on a gold standard was concluded. The type of gold standard on which it operated thereafter is the subject of the section that follows.

6. 1934-1948 -- the interwar, World War II, and postwar managed gold standard²⁶

The official price of gold remained fixed at \$35 an ounce from February 1, 1934, until March 31, 1972, when the official price was altered to \$38. In this sense, the date in 1934 marked the return to a gold standard. But the gold standard to which the United States returned was very different, both domestically and internationally, from the one it had left less than a year earlier. The Treasury bought all gold offered to it by domestic producers at the price of \$35 an ounce and sold at this price to domestic industrial users. Internationally, the Treasury bought and sold gold at

the fixed price in monetary transactions with foreign monetary authorities. The holding of gold coin and bullion was forbidden to private individuals in the United States, except for use in industry and the arts and for numismatic holdings, and gold no longer circulated domestically. The Federal Reserve continued to have a gold reserve requirement, but the state of the reserve was not a direct influence on policy at any time from 1933 until the threatened depletion of the gold reserve in the period from 1948 to 1968, under the Bretton Woods arrangements. In 1945, when the System was approaching the then existing requirement (40 percent for Federal Reserve notes and 35 percent for Federal Reserve deposits), the law was changed to require a uniform 25 percent.

Fixed buying and selling prices for gold were no longer the main reliance for maintaining rigid exchange rates with other currencies, even those of countries nominally on gold. Instead, a new finance ministry organ was created, the stabilization fund, with powers to engage in open market purchase and sale of foreign exchange and gold to influence exchange rates. During the late 1930s, most of the so-called gold-bloc countries finally left gold, and nominally floating exchange rates with government intervention through stabilization funds became the rule. During the war, many countries fixed "official" exchange rates but sought to maintain them by extensive control over foreign exchange transactions, imitating the devices developed by Hjalmar Schacht for Germany in the 1930s, rather than by free purchase or sale at fixed prices of either gold or foreign exchange. Since then, an even wider variety of multiple exchange rates came into use.

After 1934, the role of gold in the United States was not that of the base of the domestic monetary system. Rather it became a commodity whose price was officially supported in the same way as the price of wheat, for example, was under various agricultural support programs. The major difference is that the support price for agricultural products was paid only to domestic producers, the gold-support price to foreign monetary authorities as well. In addition, the agricultural products accumulated were freely sold at the support prices to anyone, the gold only to certain foreign purchasers and to licensed domestic industrial users. In consequence, the gold program set a floor under the world price of gold in terms of dollars.

The substitution in 1934 of a fixed price for gold, rather than a variable price as under the earlier purchase program in 1933 and early 1934, meant that the number of dollars spent on gold was no longer under the direct control of U.S. authorities. Having fixed the price, they were committed to buy all that was offered. But the effects of such purchases were the same as under the earlier program. For the United States, the purchases meant an increase in the dollar value of other exports relative to the dollar value of imports, thanks to a rise in prices of internationally traded goods relative to domestic goods through the combined effect of changes in exchange rates and in domestic price levels of the various countries. For gold-producing countries, the purchases meant an increased price for one of their products, hence an expansion in the gold industry relative to other industries and a rise in income. For gold-standard countries, the price fixed for gold in the United States

determined the rate of exchange between their currencies and dollars. They either had to adjust their internal price level to that new rate -- in the process presumably disposing of some of their reserves as measured in ounces of gold -- or to change their own fixed price of gold. For all gold-standard and gold-producing countries except the United States and for nongold-standard and nongold-producing countries, the gold purchases meant a reshuffling of international trade in response to a decreased U.S. demand for products other than gold, and an increased demand for such products by gold-producing countries; the program meant an increased supply of products from the United States and a decreased supply of products other than gold from gold-producing countries. Finally, international trade had to adjust to measures adopted by gold-standard countries to meet loss of their reserves.

The price fixed for gold initially overvalued the product and therefore stimulated a rapid increase in production and a rapid accumulation of government stocks. Production in the United States including its possessions rose from less than 2.6 million ounces in 1933 to 6 million in 1940; in the world from 25 million ounces in 1933 to 41 million in 1940. The rise in prices of other commodities and services from 1940 to 1948 lowered the relative price of gold and reduced U.S. gold output (1948) below its 1933 level, though world output still exceeded the level of that year.

There was an initial sharp jump in the U.S. gold stock from January to February 1934 that was accounted for primarily by the revaluation of gold, but part was produced by the substantial amount of gold imported, as

foreigners took advantage of the higher buying price that became official on January 31. Gold was almost immediately shipped to the United States. In the six weeks from February 1 to March 14, more than \$0.5 billion of gold (valued at the new price) was imported. Once the initial rush of gold imports ended, the gold stock continued to rise at a fairly steady rate to the end of 1937. Until France left gold in late 1936, roughly half of U.S. gold imports came from France. For the next year, France was a net importer of gold from the United States rather than a net exporter. During the last quarter of 1937, a large-scale withdrawal of foreign short-term balances followed rumors that further devaluation of the dollar was being considered as a possible counter-cyclical measure. Withdrawal of European short-term funds from the United States ceased in July 1938. These counter-movements roughly offset the forces making for a continued flow of gold to this country, so the total gold stock remained fairly steady from autumn 1937 to autumn 1938. Munich then led to a further flight of capital from Europe and a sudden increase in the rate of gold inflow. The outbreak of war simply maintained the rate of the gold inflow. The intensification of Britain's war effort after the fall of France in early 1940 and her attempt to tap American supplies of war material, as she had in World War I, produced a further increase. Finally, the enactment of lend-lease in early 1941, which relieved Britain and her allies of the necessity of acquiring dollars to finance war purchases, brought an end to the rapid growth of the gold stock. In sum, the gold stock in the Treasury rose from 200 million ounces when the support price was fixed in early 1934 to 630 million ounces by the end of 1940, a rise that was 1 3/4 times as much as aggregate world

output during the intervening period. The gold stock declined somewhat during the war, but an inflow in 1946-48, arising from the demand for U.S. goods of war-devastated and neutral countries, brought the stock to nearly an all-time high in 1948 (exceeded only in 1949).

The rise in the dollar price of currencies of gold-bloc countries was at first much greater than that of currencies not linked to gold. From January 1933 to September 1934 the rise was 70 percent for the currencies of France, Switzerland, Belgium, the Netherlands, and Italy, and less than 50 percent for the pound sterling. The gold-standard currencies therefore appreciated not only relative to the dollar but also relative to other currencies. The differential appreciation measured the special impact of our gold price-support program on the position of the gold-standard countries. The fact that they lost gold meant that they bore, as it were, a larger part of the effect of the expansion of U.S. exports and contraction of U.S. imports other than gold than other countries did, and thereby cushioned the initial impact on those other countries.

Had nothing else intervened, the gold-standard countries would have had to reduce their internal price levels relative to those of other countries in order to stay on gold, that is, in order to render something like the new structure of exchange rates consistent with no pressure on the balance of payments. In fact, something else did intervene, but it intensified rather than eased the problem of the gold-standard countries. Gold purchases under the fixed price-support program coincided with a flight of capital to the United States from Europe largely induced by political changes: first, the rise to power of Hitler in Germany which led to a

large-scale attempt to transfer capital out of Germany; then the increasing fears of war which led to a flight of capital from France, Britain, and other European countries.

If the United States had continued its floating exchange-rate policy of 1933 and had fixed no firm price at which it was willing to buy the world's gold, the capital flight would have produced an appreciation of the U.S. dollar relative to other currencies, which would have discouraged exports from the U.S. and encouraged imports into the U.S. That outcome would have produced the unfavorable balance of trade required as the physical side of the capital import -- and incidentally, would have worked against one of the domestic objectives of New Deal policy, namely, to raise exports relative to imports as a means of stimulating employment. If, instead, the U.S. and other countries involved had all been on a gold standard of the nineteenth century variety, the attempt to transfer capital to the U.S. would have increased gold reserves in this country, even without a rise in the dollar price of gold, and decreased gold reserves abroad; it would have increased proportionately the money stock in the U.S. and thereby have promoted a rise in domestic prices and income; and it would have decreased the money stock abroad and thereby have promoted a fall in prices and income in foreign countries. These changes would have tended to produce precisely the same shift in relative prices and the same unfavorable balance of trade as the appreciation of the dollar under the hypothetical floating exchange rates would have done.

Since the flight of capital constituted an increased demand for dollars, its effects on exchange rates and on U.S. trade in commodities and

services other than gold were in precisely the opposite direction to those of the gold price-support program and tended to offset them. There was simultaneously an increased offer of dollars for gold on the part of the U.S. government and an increased demand on the part of foreigners for dollars to hold. By trading assets held abroad for gold and transferring the gold to the U.S. Treasury, foreigners could acquire dollars and the Treasury could acquire gold without in any way affecting the rest of the U.S. balance of payments. To the extent that such offsetting occurred, the gold program did not affect U.S. trade currents and the relative prices of internationally traded goods in ways referred to earlier. Since such changes in trade currents and relative prices tended to reduce the amount of gold offered for sale to the United States at its fixed price, the capital inflow meant that this country acquired a larger amount of gold at \$35 an ounce than it otherwise would have. Hence, while the capital inflow and the gold price-support program had opposite effects on U.S. exchange rates and on U.S. trade in commodities and services other than gold, both tended to raise its gold stock. For gold-standard countries that were themselves subject to a capital outflow -- that is, for all the important gold-bloc countries that had remained on gold after 1933 -- the capital inflow reinforced rather than offset the effect of the gold price-support program. It required an additional reduction in internal price levels beyond that called for by the support program. Exports had to be still larger relative to imports if they were to finance the capital outflow without a continued outflow of gold.

The deflation that would have been required by the combined effect of

the U.S. gold price-support program and the capital outflow was more than the gold-bloc countries were willing to undergo, as perhaps the effect of either alone might also have been. Accordingly, in the fall of 1936, France and Switzerland devalued their currencies in conjunction with a tripartite agreement between the United States, France, and Great Britain. The governments of Belgium and the Netherlands, which followed suit, and Switzerland also subscribed to the agreement.²⁷

All these countries set up exchange stabilization funds. The Tripartite Agreement of September 25, 1936, provided that stabilization fund holdings of foreign currencies would be used to avoid undesirable fluctuations in exchange rates. Arrangements for mutual currency support were undertaken, based on daily gold settlements at prearranged prices. Each day the authorities of the six countries would cable each other the prices in terms of their own currencies at which they would sell and buy gold for the next twenty-four hours. Each party would then decide, without risk of exchange losses, the buying and selling rates for the currencies of the other participants. Foreign balances at the end of each day were convertible into gold at the guaranteed price. The agreement was a precursor of the swap arrangements that the industrialized countries perfected during the Bretton Woods period of international monetary arrangements. Under the agreement, the U.S. stabilization fund purchased foreign currencies in New York at rates the foreign funds determined and that day converted these currencies into gold earmarked to its account abroad or released to it from foreign earmarked holdings in the United States. Mainly, however, gold imports into the United States were sold

directly by foreign monetary authorities or private importers.

In purchasing gold, as in purchasing agricultural or other commodities, the U.S. government can be said to have three sources of funds: tax receipts, borrowing, or money creation. The one difference is that the support program for other commodities (excepting silver) carried with it no authorization to create money, whereas the support program for gold did, thereby automatically providing the financial means for its continuance. Treasury deposits at Federal Reserve Banks could be increased through gold purchases by gold certificate credits equal to the amount of gold purchased times the official price of gold. Except for a minor handling charge (1/4 of 1 percent), this was also in practice the amount the Treasury spent by drawing a check on its deposits in acquiring gold. Gold purchases were usually financed in this way; hence, increases in the gold stockpile produced no automatic budgetary pressure. The link between gold purchases and Treasury authorization to create high-powered money was the main remnant of the historical role of gold, and served to give gold some special monetary significance. The one important occasion when a different method of finance was used was in 1937, when the Treasury "sterilized" gold by paying for gold with funds raised through security issues.²⁸

It is easier to describe the gold policy of the United States during the years 1934-1948 than it is to describe the resulting monetary standard of the United States. It was not a gold standard in the sense that the volume of gold or the maintenance of the nominal value of gold at a fixed price could be said to determine directly or even at several removes the volume of money. It was clearly a fiduciary rather than a commodity

standard, but it is not possible to specify briefly who managed its quantity and on what principles. The Federal Reserve System, the Treasury, and still other agencies supervising the banking system affected the quantity of money by their actions in accordance with a wide variety of objectives. In principle, the Federal Reserve System had the power to make the quantity of money anything that it wished, within broad limits, but it seldom stated its objectives in these terms. It sometimes, as when it supported the prices of government securities from 1942 to 1951, explicitly relinquished its control. And it clearly was not unaffected in its actions by gold flows. So long as the exchange rate between the dollar and other currencies was kept fixed, the behavior of relative stocks of money in various countries was necessarily close to what would be produced by gold standards yielding the same exchange rates, even though the mechanism might be quite different.

7. 1948-1968 -- the Bretton Woods dollar/gold standard system²⁹

The international monetary system that was designed at the Bretton Woods Conference in 1944 reflected professional views on the defects of the arrangements that had prevailed in the 1930s. Protectionist trade policies, exchange controls, and competitive currency depreciations of the pre-World War II period were the cautionary experiences to be avoided by the postwar world. Removal of controls on trade and payments under a system of fixed exchange rates, with adjustment of parities limited to "fundamental" disequilibrium in the balance of payments, accordingly were the goals of the system created by the delegates to the Conference. The lending facilities of the Fund were to be available to supplement IMF

members' gold and foreign exchange reserves to provide them liquidity when in temporary balance of payments deficit.

Under the Bretton Woods Agreement of 1944, the Articles of Agreement of the International Monetary Fund provided that currency par values should be expressed in terms of gold or of the U.S. dollar expressed in gold. IMF members were required to pay 25 percent of their quota subscriptions in gold, with some discretion allowed to reduce the gold proportion for countries with a weak reserve position. Gold subscription payments became a permanent asset of the Fund available to supplement its lending resources; many types of transactions between the IMF and its members were required to be made in gold; and members were required to maintain the gold value of IMF holdings of their currencies. Thus gold was to play a central role in virtually all aspects of IMF operations, and of countries' international monetary obligations as defined in the IMF Articles.

As the Bretton Woods system evolved in practice, most countries maintained the legal par values for their currencies by intervening in the exchange markets to maintain exchange rates for their currencies at specified levels in terms of the U.S. dollar. Only the United States met its par value obligations by undertaking freely to buy and sell gold in official transactions at the official price — the dollar's par value. The entire system of exchange rates was thus linked to gold through the convertibility undertakings of the United States.

The establishment of par values for currencies was an important item on the Fund's agenda. Canada, France, the Netherlands, the United Kingdom and the United States declared their par values in December 1946; Germany and

Japan in 1953, shortly after they became members; and Italy, not until 1960. Some of these parities were short-lived. An abortive attempt at convertibility of sterling in 1947 ended in September 1949, when the pound was devalued. The Netherlands thereupon devalued the guilder, and France, which had had separate rates for financial and commercial transactions, unified them, depreciating the franc vis-a-vis sterling.

In private gold markets until 1953, the price of gold was at a premium, but the IMF rule required monetary authorities to refrain from selling gold at premium prices. In March 1954, several months after the premium had been eliminated, reflecting balance of supply and demand, the London gold market reopened. For the rest of the decade, the price of gold in private markets remained at \$35 an ounce.

With the return of many European currencies to convertibility in 1958, the achievement of the Bretton Woods conception of international monetary normalcy seemed only a matter of time. The outflow of dollars in U.S. official aid, military spending, and private investment, and economic recovery in Europe and Japan had enabled foreigners to add to their holdings of dollars and gold. Apart from the 1950-51 Korean war upsurge, U.S. prices were generally stable until the middle of the decade of the '60s, and their rate of rise generally lower than in the rest of the world. Money supplies in the rest of the world (except in the U.K.) grew at a faster rate than in the U.S. perhaps as a result of the U.S. contribution to the buildup of other countries' monetary reserves. The dollar's status as the reserve currency of the international economy seemed impregnable. Commercial banks and private firms could make foreign payments in their

convertible currencies without the approval of central banks. Tariff and quota restrictions on commodity trade among the industrialized countries were eased and foreign trade grew at a rapid rate during the period. International transfers of capital grew, with New York at the center of the flows, and the dollar assumed the role as the vehicle currency in which the borrowers obtained capital and the investors lent their savings.

The successful operation of the system depended on foreign central banks intervening with their own currencies against the dollar to maintain par values, and the United States standing ready to buy or sell gold at \$35 per ounce in transactions with foreign monetary authorities. The U.S. balance of payments accordingly was determined largely by the exchange parities other countries established. In general, other countries desired surpluses that would add to their dollar reserves, and the system tended to produce a steadily weakening U.S. balance of payments and growing doubts about the sustainability of the U.S. gold convertibility commitment.

A portent of the troubled future of the system was that 1960 was the first year in which U.S. gold reserves declined below the level of its total liquid liabilities to all foreign holders of assets denominated in dollars (Table 2-1).

Concern over the continuing conversion of dollars into gold led the Treasury to activate the Exchange Stabilization Fund. In its initial operations on March 13, 1961, acting through the Federal Reserve Bank of New York as its agent, the Fund sold forward D-marks to reduce the premium on that currency.³⁰ On February 13, 1962, the Bank was also authorized to buy or sell foreign currencies on behalf of the Federal Open Market

Committee in both spot and forward markets. For this purpose access to a stock of foreign currencies in addition to those acquired from the Stabilization Fund was needed. The Federal Reserve therefore negotiated a network of swap facilities with the central banks of other countries. The swap provided a specific amount of foreign currency in exchange for an equivalent dollar credit for the foreign central bank, with each party protected against loss due to a change in the par value of the other party's currency. Invested balances of both parties earned the same rate of interest, foreign balances in special U.S. Treasury certificates, Federal Reserve balances in interest-earning deposits abroad. Balances were available for payments to the other party or for foreign exchange market transactions. The swap was a credit line, usually for 3-month periods, renewable at maturity. By drawing on the credit, gross reserves of both parties were increased. The U.S. normally used the proceeds of a swap to absorb dollar holdings, in effect, substituting forward cover to foreign official dollars held by the partner, to reduce the threat of their conversion into gold.

Table 2-1

U.S. Monetary Gold Stock and Liquid Liabilities to Foreigners
(millions of dollars)

End of Year (1)	Total Monetary Gold Stock ^a (2)	Total Liquid Liabilities to All Foreigners ^c (3)
1954	21,793	12,454
1955	21,753	13,524
1956	22,058	15,291
1957	22,857	15,825
1958	20,582	16,845
1959	19,507	19,428
1960	17,804	20,994
		21,027
1961	16,947	22,853
		22,936
1962	16,057	24,068
1963	15,596	26,361
		26,322
1964	15,471	28,951
		29,002
1965	13,806 ^b	29,115
1966	13,235	29,904
		29,779
1967	12,065	33,271
		33,119
1968	10,892	33,828
		33,614
1969	11,859	41,735
		41,894
1970	11,072	43,291
		43,242
1971	10,206	64,166
		64,223
1972	10,487 ^d	78,680
1973	11,652 ^e	87,620
1974	11,652	120,325 ^f
1975	11,599	127,432 ^f
1976	11,598	152,468 ^f
1977	11,719	193,977 ^f
1978	11,671	244,577 ^f
1979	11,172	268,311 ^f
1980	11,160	295,496 ^f

Notes to Table 2-1

Source: Col. (2): Treasury Bulletin, December 1965, IFS-1;
July 1975, IFS-1; October 1981, IFS-1.

Col. (3): Treasury Bulletin, July 1975, IFS-2;
October 1981, IFS-2.

(a) The stock includes gold sold to the U.S. by the IMF with the right of repurchase, and gold deposited by the IMF to mitigate the impact on the U.S. of foreign purchases for the purpose of making gold subscriptions to the IMF under quota increases.

(b) The figure excludes \$259 million gold subscription to the IMF in June 1965 for a U.S. quota increase that became effective Feb. 23, 1966.

(c) The total includes small amounts due to the IMF arising from gold transactions, amounts due to official institutions, commercial banks abroad, to other foreigners, and to nonmonetary and regional organizations. Nonliquid liabilities to official institutions included in the source beginning 1962 through 1973 have been deducted. Years for which two entries are shown show differences because of changes in reporting coverage. Figures on the first line are comparable with figures for preceding dates; figures on the second lines are comparable with those for the following dates.

(d) Change in par value of dollar on May 8, 1972, increased the recorded value of the total gold stock by \$828 million.

(e) Change in par value of dollar on Oct. 18, 1973, increased the recorded value of the gold stock by \$1,165 million.

(f) Includes categories of liabilities previously classified as nonliquid.

Repayment of short-term swap credits meant a corresponding decline in gross reserves. For the U.S. this could entail a loss of gold. To deter this eventuality, the U.S. began issuing nonmarketable bonds, with maturities of 15 months to two years, denominated in the holder's currency, to fund outstanding swap debt.

A further indication of U.S. concern about gold was the prohibition after mid-1961 on holding of gold outside the U.S. by U.S. firms and households, and on March 3, 1965, the abolition of gold reserve requirements against Federal Reserve deposits.

A focus of pressure on the U.S. dollar was the London gold market. In March 1960, the price rose above \$35 an ounce, as European central banks and private investors bought gold for dollars. The Bank of England sold gold to stabilize the price, but the U.S. Treasury initially was not willing to restore the Bank's holdings. Hence, when a rise in the price of gold occurred in October, the Bank did not intervene. On October 27, with the price reaching \$40 an ounce, the Treasury agreed to sell gold to the Bank, reserving for the Bank the decision on intervention in the market. European central banks soon after agreed to refrain from buying gold in the London market for monetary purposes whenever the price rose above \$35.20, the U.S. price plus shipping costs. When the price fell below that level in 1961, the central banks returned to the market. However, in October 1961, when the price again was reacting to heightened demand, an agreement to create a "gold pool" was reached among the U.S. and seven European central banks. Each member undertook to supply an agreed portion of net gold sales to stabilize the gold market, as the Bank of England, as agent for the group, determined to be appropriate. The members of the pool

subsequently agreed not to buy gold individually on the market, but to give the Bank of England the right to buy on their joint account when gold supply exceeded demand, the amount purchased to be distributed in proportion to each country's contribution to the pool. The pool functioned until a surge of buying led to the suspension of the arrangement in March 1968. During the period of the pool's operations, the participants sold a net total of \$2.5 billion of gold on the London market, of which \$1.6 billion was provided by the United States.

A key development for the international monetary system that was not perceived as such at the time was the acceleration of the U.S. monetary growth rate and the subsequent acceleration of the U.S. inflation rate in the final years of this subperiod. What was perceived was the cumulative growth of deficits in the U.S. balance of payments. Assets denominated in dollars grew in excess of the demand for them by the rest of the world. Their conversion into gold, by shrinking U.S. gold reserves, threatened one of the basic underpinnings of the Bretton Woods structure, namely, convertibility of dollars into gold.

The Bretton Woods system might have been able to survive an end of gold convertibility. It could not survive the inflationary policies of the center country that characterized the decade from the mid-60s on. Crisis management by the IMF and the central banks of the leading industrialized countries became the hallmark of the international monetary system during the heyday of Bretton Woods.³¹ The chief currency under pressure, apart from the dollar, was sterling. Persistent or recurring U.K. balance of payments deficits impaired the credibility of sterling's external value, already insecure by reason of the size of sterling balances held worldwide

relative to U.K. gold and foreign exchange reserves. Private agents displayed lack of confidence in the dollar and sterling by shifting to currencies whose external values were regarded as stable or likely to appreciate (during this period, the D-mark and guilder). Repeated rescue operations to support the exchange value of sterling were overwhelmed in November 1967. Sterling, however, was a sideshow. The main act was the dollar's performance.

The gold market was the market in which participants expressed lack of confidence in the dollar-based international monetary system. After the devaluation of sterling in November 1967, the vulnerability of the dollar took center stage. In the winter of 1967-68, a surge of demand for gold threatened both the London gold pool and the \$10 billion statutory backing for Federal Reserve notes. On March 12, 1968, the U.S. gold reserve requirement was abolished. Ostensibly, the gold stock was then available for conversion of dollars held by foreign central banks. On March 17, however, the London gold market was closed to avoid further U.S. gold losses. The members of the gold pool announced that they would no longer supply gold to the London or any other gold market and that they no longer felt it necessary to buy gold from the market. Official transactions between central banks were to be conducted at the unchanged official price of \$35 an ounce, but the gold price for private transactions was to be determined in the market. Central banks were still free to buy U.S. Treasury gold for dollars but some in fact refrained from doing so. Germany had explicitly forsworn converting its dollar holdings into gold in May 1967.

One measure the U.S. authorities might have taken was a rise in the dollar price of gold, thus increasing the value of the stock and the flow of reserve assets. If other countries did not follow suit by adopting a proportional increase in the price of gold in their currencies, the U.S. in this way might have obtained a devaluation of the dollar. Had the price of gold risen, the gold demands of other countries might have been satisfied without the rundown in U.S. reserve assets. Some countries might also have revalued because of the inflationary consequences of their payments surplus, given the gold-based increase in their asset holdings.

The U.S., however, resolutely opposed a change in the monetary price of gold. Such action would have required an Act of Congress which would have produced a long and unsettling debate in the two Houses, during which time the foreign exchange markets would have been disturbed. Moreover, there was no assurance that other countries would not make corresponding changes in their own par values, and it was feared that confidence in the stability of the monetary system would be seriously impaired by a change in the official dollar price of gold. Given the fixed price of gold when national price levels were rising, gold became an undervalued asset with a resulting gold shortage.

The measures adopted to avoid exchange rate changes were intended in part to limit international transmission of price change.³² Surplus countries tried to avoid price increases; deficit countries, price declines, both as external consequences of their balance of payments positions. Intermittently, depending on cyclical conditions, countries in both categories took steps to right payments imbalance.

Since palliatives to improve the balance of payments proved ineffective, deficits had to be financed either by drawing down reserves or seeking external credit or borrowing facilities, while surpluses obviously increased reserve accumulations. During the heyday of the Bretton Woods system, despite the growth of dollar assets, the adequacy of international liquidity, in the sense of the quantity of international monetary reserves, was widely debated. Discussions during this period growing out of concern for the supply of reserves led to the creation of SDRs by the IMF.³³ Until 1968, international reserves, however, were limited to gold, convertible foreign exchange, and reserve positions in the IMF.

Contrary to the expectation of the way the Bretton Woods system would operate, financing of payments imbalances for the most part was arranged through credits governments extended on a bilateral basis and through international borrowing and lending activities of commercial banks. Thus, facilities for international borrowing and lending, apart from the IMF drawing facilities, became an increasingly important part of the system.

Official dollar reserves of the surplus countries were augmented at times by actions those countries took in the Eurodollar market. Dollars acquired by their central banks and deposited in the Eurodollar market either directly or through the Bank for International Settlements would usually be relent to private borrowers who could resell the dollars to the central banks.

In sum, world reserves grew rapidly during the period.

8. 1968-1973 -- the breakdown of the Bretton Woods system

The devaluation of sterling in November 1967 was not regarded as the prelude to changes in the par values of other currencies, the devaluation of the dollar in terms of gold, the realignment of exchange rate relationships among the major currencies, and the substitution of a short-lived regime of central rates for the par value system -- all of which took place between November 1967 and December 1971. Instead, it was hoped that balance in the U.S. and U.K. external payments was finally on the point of achievement, and that the creation of a special drawing rights facility in the IMF would replace reserve assets that dollar and sterling deficits had provided.

The hope was belied. The pattern of deficits and surpluses persisted and worsened in 1970 and 1971. The U.S. current account surplus dwindled and the U.S. capital account deficit grew dramatically, producing current account surpluses and capital inflows in other countries. The activation of SDRs in 1970-72 provided additions to already massive acquisitions of dollar reserve assets.³⁴

As in the heyday of the Bretton Woods system, disbelief of market participants in the pegged external values of currencies precipitated turbulence in the foreign exchange market.

The persistent outflow of funds from the U.S. overwhelmed foreign exchange markets in the first few days of May 1971. On May 5, seven European countries closed their foreign exchange markets, and five others on several continents withdrew their support for the dollar and suspended dealings in D-marks, guilders, and Swiss francs. On May 9, both Germany

and the Netherlands announced that their currencies would float, since they could not maintain exchange rates within the established margins.

In March 1971, before the panic of the foreign exchange market, there was a request from several European countries for conversion of officially held dollars into gold to enable them to pay for an increase in their IMF quotas. The payout reduced the U.S. gold stock to the lowest level since 1936. The dollar outflow meanwhile accelerated, leading, as noted, to the floating of European currencies. The imbalance between U.S. gold reserves and outstanding dollar liabilities and the weakening U.S. balance of payments position occasioned the changes the U.S. introduced on August 15, 1971, to achieve a dollar devaluation. Chief among them (besides a price and wage freeze, tax increases and federal government spending cuts) was a 10 percent import surcharge on 50 percent of total U.S. imports. The convertibility of the dollar into gold was formally suspended, as was the use of the swap network through which dollars could be exchanged with central banks for other currencies. The effect was to oblige other countries to hold dollars or to trade them for a price determined in the market and so revaluing their currencies. Foreign exchange markets abroad, except in Japan, shut down. The Japanese initial attempt to maintain the pegged rate of the yen compelled them to purchase \$4 billion in the two weeks after August 15. The yen was then freed to float upward; other currencies floated when exchange markets were reopened on August 23. France introduced a dual exchange market, with trade and government exchange dealings based on the par value, financial exchange dealings at a floating rate. Restoration of a repegged system of exchange rates,

however, remained the goal of the U.S. and its partners.

After much negotiation, a readjustment of currency parities was arranged at a meeting at the Smithsonian Institution in Washington on December 17-18, 1971. In return the U.S. agreed to withdraw the import surcharge. Currencies were revalued by percentages ranging from $7\frac{1}{2}$ (Italy) to 16.9 percent (Japan), with the proviso that $2\frac{1}{4}$ percent margins of fluctuations (replacing the former 1 percent margin) above and below the new so-called "central" exchange rates were permissible. The Canadian dollar continued to float. The Smithsonian agreement also specified that the official dollar price of gold would henceforth be \$38, a formal devaluation of the dollar. While the dollar remained inconvertible, the new official dollar price of gold implied a depreciation of the gold-value of the dollar rather than an appreciation of the dollar value of other currencies.

The central rates established at the Smithsonian meeting crumbled during the nine months following the floating of sterling in June 1972. Once again, the disbelief of market participants in those rates was revealed in the gold and foreign exchange markets. The London free market price of gold rose with few reversals. Money growth and inflation rates continued to rise in the U.S. and both the balance of trade and the U.S. balance of payments deficit soared, with a corresponding surge in dollar holdings of the industrialized European countries and Japan. Capital controls were imposed in 1972 by the Netherlands and Japan before sterling was floated and Germany followed suit afterwards. On February 10, 1973, Japan closed its foreign exchange market and suspended support of the

dollar. New central values were set in a hurried round of negotiations, although the lira, yen, Canadian dollar, the U.K. and Irish pounds, and the Swiss franc all floated. Again, the official dollar price of gold was raised (this time to \$42.22), leaving unchanged the gold value of other currencies. The new central rates did not staunch the flow of dollars abroad, and a further crisis erupted in March 1973. This time the major industrial countries discontinued pegging their exchange rates to the dollar. The EEC countries in the snake, which had been activated in April 1972, plus Sweden and Norway agreed to a joint float, with Germany revaluing by 3 percent (in terms of SDRs) in relation to the other members. Canada, Japan and Switzerland floated individually, as did a handful of other countries. Though a large group of nonindustrialized countries pegged to the dollar, the dollar currency area worldwide contracted; smaller groups of countries pegged to the French franc or to the pound.

In retrospect, it is likely that under an adjustable peg system, such as the Bretton Woods system turned out to be, whichever currency is at the center ultimately becomes overvalued. The reason is the asymmetry of actions of the nonreserve currency countries in the system. An overvalued currency tends to induce prompt readjustment because weak exports and excessive imports create pressure for action. On the other hand, an undervalued currency tends not to produce pressure for readjustment because strong exports and weak imports are easy to live with. On net, the nonreserve currency countries that demanded action by the United States to right its balance of payments produced devaluations of their currencies

against the dollar.

9. 1973-1981 -- the United States on an inconvertible paper standard

When pegged rates were abandoned in March 1973, it was initially assumed that floating was a temporary expedient to be succeeded by a reformed par value system. The U.S. took the lead in opposing the return to such a system. The dispersion of inflation rates among the industrialized countries and the higher variability of rates of inflation since the late 1960s enforced more frequent changes of exchange rates. Under the earlier system, changes in par values were delayed until foreign exchange market crises were provoked. The lesson since the shift in March 1973 was that floating provided more flexibility. The U.S. view prevailed. With the suspension of official gold convertibility, and widespread departures from the IMF's par value provisions, negotiations were held to codify, in the form of amendments to the IMF Articles, the international monetary arrangements that had evolved in practice.

Under amendments to the IMF Articles agreed in early 1976 and implemented in April 1978, gold was formally removed from its previous central role in the IMF and IMF par value obligations were eliminated. The official IMF gold price was abolished, as were also par value, gold convertibility, and maintenance of gold value obligations. Gold was eliminated as a significant instrument in IMF transactions with members, and the IMF was empowered to dispose of its large gold holdings. Although the amended IMF Articles do provide for the future possibility of establishing a system of stable but adjustable par values, such a decision by the Fund would require an 85 percent affirmative vote by the IMF

members, thus giving the United States an effective veto. The provisions in the amended IMF Articles relating to establishment of par values specify that the common denominator of the system shall not be gold or a currency.

It was widely believed that the desired stock of reserve assets would contract in a world of floating exchange rates compared to a world of pegged rates. In fact, official holdings of reserve assets have increased in every year since the float. From 1950 to 1969, on average, world reserves including gold rose by less than 3 percent per year, the foreign exchange component by 5 percent per year. From the end of 1969 to the end of 1972, the average annual rate of increase of foreign currency reserves was 43 percent. Since 1973, the average annual rate of increase has been 15 percent. The main source of growth of foreign currency reserves since 1973, as in earlier years, has been in the form of dollars. The apparent demand for reserves has increased even under floating rates.

A significant change in the distribution of foreign exchange reserves has occurred since October 1973 as a result of the rise in the price of oil. Total foreign exchange reserves of industrial oil-importing countries have increased at a slightly slower pace than reserves of all countries, which sextupled since 1970, but the major oil-exporting countries, which in 1970 held only about 8 percent of total world foreign exchange reserves, by the end of the decade held about one-quarter of the total.

Although other currencies have increased their roles as reserve currencies in recent years, the dollar has continued to serve as the main reserve currency, accounting for on the order of four-fifths of the world's official foreign exchange reserves. As under pegged rates, the U.S.

continues to settle its payments deficits in dollars, which foreigners add to their asset holdings and use in payments to other countries. The dollar also remains the main official intervention currency in foreign exchange markets, and serves as a common vehicle currency in the interbank market for foreign exchange. In effect, the world has adopted an inconvertible dollar standard.

One change in the international reserve profile was the creation on March 13, 1979, of the European Monetary System — replacing the "snake", the European joint float — by nine European countries (Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, and the Netherlands; the U.K. is a member but does not participate in intervention arrangements). The center of the system is the European Currency Unit (a basket of all nine currencies), issued by the European Monetary Cooperation Fund in an amount equal to a deposit of 20 percent of gold and dollar reserves of participating countries, to be used for settlement of intervention debts. ECUs, now included in foreign exchange holdings of the participating countries, do not increase world monetary reserves, except for revaluation changes. The ECUs issued value gold on the basis of either the average market price of the six preceding months or the average market price on the day before issue, whichever was lower.

With gold valued at market price, world gold reserves at the end of 1979 were larger than foreign exchange reserves. The U.S. and a number of other countries, however, continue to value their gold assets at the official price of \$42.22 per ounce, despite the abolition of an official IMF price for gold.

After the float, the U.S. took the position that gold should be demonetized. An opposing view was promoted principally by France. Developments reflect the extent to which one or the other dominated international decisions. At issue was the use of gold in official transactions at the free market price, and the substitution of gold for the dollar in inter-central bank settlements at a fixed but higher official price.

The prescription against official transactions in the gold market that had been adopted in March 1968 was terminated in November 1973, but the official price of \$42.22 posted in February 1973 was so far below the private market price that central banks were unwilling to buy and sell gold among themselves at the official price. The central banks were equally reluctant to sell gold on the private market in view of the possible depressive effect of sales on the market price or in anticipation of the opportunity to sell in the future at a higher price. In December 1973, the IMF terminated arrangements made four years earlier, under which it had been prepared to purchase gold from South Africa.

In June 1974, countries in the Group of Ten agreed that gold could be used as collateral for inter-central bank loans at a price other than the official gold price, and in September, Italy obtained a loan from Germany on the pledge of Italian gold valued at a mutually agreed price. In December, the U.S. and France agreed that central banks were at liberty in valuing gold holdings for balance sheet purposes to use the market price, which the Bank of France proceeded to do.

Early in 1975, the countries in the Group of Ten and Switzerland agreed

for a two-year period not to increase the sum of their and the IMF's gold holdings and to contribute no support to the price of gold in the free market. In August 1975 agreement was reached by an IMF committee that³⁵

The official price of gold would be abolished

members would not be obliged to use gold in transactions with the Fund

a part of the Fund's gold holdings would be sold at auction for the benefit of developing countries and another part would be returned to member countries in proportion to their quotas.

The first public auction of part of the Fund's gold holdings was held in June 1976. A four-year sales program was scheduled. In the first two years, 16 auctions were held approximately every six weeks, with aggregate sales of 12.5 million ounces. The balance of 12.5 million ounces was sold mainly in 24 auction lots through May 1980, and a small amount in noncompetitive sales. Restitution of 25 million ounces to member countries over a four-year period was completed in December 1979/January 1980.

The U.S. repealed the prohibition against gold holding by U.S. residents as of December 31, 1974, and the Treasury offered gold at auction to help meet the expected increase in public demand for gold. The first auctions were held in January and June 1975, when the Treasury disposed of 1.3 million ounces. No auctions were held in 1976 and 1977. They were resumed in 1978 and 1979, when the Treasury sold 4.0 and 11.8 million ounces, respectively, motivated both by the desire to reduce the U.S. balance of payments deficit on current account and by the belief "that neither gold nor any other commodity provides a suitable base for monetary arrangements."³⁶

The gold sales were equivalent to open market operations, in their

economic effect, approximating \$0.8 billion in 1978 and \$3.3 billion in 1979. Gold sales by the Treasury reduced the public's deposits and also bank reserves. The sales thus initially may have served as a partial offset to Federal Reserve open market purchases of government securities that increased the public's deposits and bank reserves. It was a partial offset only because the System's portfolio of government securities showed a net increase of \$7.7 billion in 1978 and of \$6.9 billion in 1979. It was an offset initially only depending on the Treasury's use of the proceeds of the gold sales. To the extent that the Treasury used the proceeds to retire gold certificate credits and thereby reduced its deposits at the Federal Reserve, the monetary effects of the gold sales were contractionary. However, to the extent that it disbursed the remainder of the funds it acquired, the Treasury's action restored the public's deposits and bank reserves, so the contractionary effect on the money supply of the gold sales was limited.³⁷

Since 1979, the Treasury has sold no gold bullion. In July 1980, however, it began the sale of half-ounce and one-ounce gold medallions, in accordance with P.L. 95-630, November 10, 1978. The legislation provided that not less than 1 million troy ounces of fine gold per year be struck into medallions and sold to the public over a five-year period at a price covering all costs. In 1981, U.S. Government gold inventories amounted to 264.2 million ounces. The Reagan Administration has announced that its position on the proper role of gold in the international monetary system will not be formulated until the Congressionally mandated gold commission issues its report.

Direct official intervention to maintain the open market price of currencies within narrow limits has not lessened under floating rates

compared with the pegged parity system. Intervention in some countries is assigned to nationalized industries that borrow foreign currency in order to buy their own currency on the foreign exchange market, in Italy and the U.K., with government provision of insurance against foreign exchange loss, in France with no such provision. In Japan and sometimes in France, dollar deposits held by the government at commercial banks are used for intervention. Italian and French commercial banks intervene at the government's behest. Central bank intervention may thus be conducted by a variety of institutions at the direction of the monetary authorities.

The pattern of intervention in recent years since the float by the U.S. (until early 1981) and its trading partners was to buy dollars when the dollar depreciates and sell dollars when the dollar appreciates. Countries with weak currencies sell dollars. When the supply of dollars increases in foreign exchange markets, managed floaters may buy up some of the additional dollars or may permit the price of dollars to fall in terms of their own currencies.

There was apparently little intervention during the four months following the float in February 1973. The progressive decline in the weighted exchange rate of the dollar between February and July 1973 vis-a-vis a group of major currencies led to a decision by the governors of the central banks of the Group of Ten to support the dollar. In July 1973, the Federal Reserve began to intervene in the New York exchange market to maintain "orderly market conditions." Intervention was effected with the Federal Reserve's own small holdings of foreign currency or by activating the much larger total of foreign currency resources available through swap

agreements.

Concerted exchange intervention was agreed to by the Federal Reserve, the Bundesbank, and the Swiss National Bank in May 1974, after several months of dollar depreciation. The dollar strengthened until September when renewed weakness developed through March 1975. The explanation given by the Board of Governors was:³⁸

Contributing to this decline in the dollar's exchange value was the asymmetry in intervention policies between countries with weaker currencies and those with strengthening currencies. Intervention sales of dollars by countries supporting weaker currencies exceeded purchases of dollars by countries resisting the appreciation of their currencies. The net effect of these operations was to add to the market supply of dollars, depressing the dollar's average exchange rate.

Explicit though limited approval of management of floating exchange rates was expressed by the IMF in guidelines it issued in June 1974.³⁹ Acceptance of intervention as desirable to counter disorderly market conditions was reiterated in a November 1975 meeting that preceded the revision of the IMF's Articles of Agreement in 1976.

The dollar showed little weakness in 1976, and the Federal Reserve intervened to sell dollars on behalf of other currencies. In January the Italian lira came under pressure. The decline in its exchange value weakened the French franc within the European currency "snake," leading to substantial French intervention. Massive intervention to support sterling, which declined from \$2.00 in March to \$1.77 in mid-September, was provided by a \$5.3 billion stand-by credit arranged by the Group of Ten countries,

Switzerland, and The Bank for International Settlements. Sterling's further decline later in the year led to an IMF drawing, further borrowing, and a facility to reduce official sterling balances. Intervention was also conducted to moderate appreciations of the D-mark, the Swiss franc, and the yen.

Renewed weakness of the dollar in early 1977 was masked in part by large intervention purchases of dollars by the Bank of England and the Bank of Italy undertaken to limit the appreciation of their currencies and to rebuild their reserve positions. The Federal Reserve intervened only occasionally during the first three quarters but, as the dollar dropped more sharply, the Federal Reserve increased the scale of intervention. In January 1978, the Federal Reserve was joined by the U.S. Treasury Exchange Stabilization Fund, which negotiated a new swap facility with the Bundesbank.

The decline in the weighted average exchange value of the dollar accelerated in 1978 through the end of October.⁴⁰ An anti-inflation program announced on October 24 (involving fiscal restraints, voluntary wage and price standards, and a reduction in the cost of regulatory actions) did not moderate the dollar's slide on the exchange market. On November 1, the Administration and the Federal Reserve took further action. Foreign exchange resources equivalent to \$30 billion were mobilized to finance intervention as needed to support the dollar in cooperation with Germany, Japan, and Switzerland. The Federal Reserve raised the discount rate from $8\frac{1}{2}$ to $9\frac{1}{2}$ percent, and imposed a 2 percent supplementary reserve requirement on large time deposits. During the last two months of 1978,

U.S. exchange market intervention in support of the dollar totaled \$6.7 billion, accompanied by significant purchases of dollars by Germany, Japan, and Switzerland. By June 1979, the dollar had risen from its 1978 trade-weighted low by about 10 percent. From that month on, the dollar weakened. The Federal Reserve raised the discount rate to 11 percent in September, and the U.S. sold the equivalent of \$4.2 billion in D-marks between August and early September.

On October 6, 1979, the Federal Reserve announced a wide-ranging set of measures to tighten monetary control (a shift in operating procedures from control of the Federal Funds rate to control of bank reserves; an increase in the discount rate to 12 percent; a marginal reserve requirement on banks' managed liabilities), and the dollar began to appreciate. After April 1980, however, the dollar began to decline, a movement that was reversed in September. From February 1980 on, the U.S. intervened frequently, operating on both sides of the market. When the dollar was in demand, it acquired foreign currencies in the market and from correspondents to repay earlier debt and to build up balances. The United States was a buyer from February to March. From late March to early April and beyond, it sold D-marks, Swiss francs, and French francs. By the end of July, the U.S. was again accumulating currencies, making net purchases of D-marks and lesser amounts of Swiss francs and French francs. By the end of 1980, the U.S. was intervening in the foreign exchange markets virtually on a day-to-day basis.

Shortly after taking office, the Reagan Administration announced its intention to limit U.S. intervention only to instances of serious market

disorder. The reason for the shift in policy is the Administration's view that intervention is costly and ineffectual — and may indeed be harmful — and that the way to restore exchange rate stability is by the creation of more stable domestic economic conditions. Many foreign central banks, while generally in agreement with the basic principles underlying the Administration's views, continue to employ a more active intervention policy. It is doubtful, however, that such intervention has much effect over time on the exchange value of their currencies.

The Bretton Woods system broke down in part because non-reserve currency countries were unwilling as a group to adopt the inflationary policies the reserve-currency country was pursuing. To achieve independent monetary policy, the only workable exchange rate system was floating, and it was hoped that flexible exchange rates would permit a country to choose its desired long-run trend rate of monetary growth and of inflation, independent of other countries' choices.

Even when autonomy exists, monetary policy may perform badly. It is in this context that the movement in a number of countries during the 1970s toward the improvement of monetary control must be viewed.

Central banks have typically used short-term interest rates as the instrument to control monetary growth. Under non-inflationary conditions, this conduct produced a pro-cyclical movement in monetary growth. Under the gathering inflationary conditions since the mid-1960s, the inflation premium that became imbedded in interest rates made the instrument unreliable as an indicator of restriction or ease. Reliance on it contributed to a secular rise in the rate of monetary growth. Central

banks in a number of countries, some more willingly than others, in the 1970s adopted targets for monetary growth without necessarily abandoning their desire to hold down interest rates or exchange rates, so that successful targeting has not invariably been the result. If it was hoped that public announcement of targets for monetary growth would itself reduce expectations of inflation, the failure time after time to achieve the targets has diluted any possible effect on the formation of expectations.

The period since October 6, 1979, when the Federal Reserve announced a new procedure to improve control of monetary aggregates, is probably too brief to pronounce judgment on the likelihood that the System will achieve its objectives of deceleration in monetary growth. The inconvertible paper monetary standard operated at the discretion of monetary authorities is on trial.

What is the current role of gold? IMF members no longer define the exchange value of their currency in terms of gold and account for gold at any price consistent with their domestic laws. Gold is no longer the numeraire of the international monetary system. The introduction of SDRs (valued in terms of a basket of national currencies, as of July 1974), rather than in terms of gold, was intended to supplement both the dollar and gold in the international monetary system.

The market price of gold until 1980 increased more rapidly after the float than the prices of most other durable assets.⁴¹ The future role of gold in the international monetary system as a reserve asset and as a determinant of the world's price level may depend importantly on the performance of the dollar. If the performance of the dollar improves, gold may play a minor role even if its use as a reserve asset continues.

Failure of the dollar to perform in a stable fashion in the future leaves open the possibility of a restoration of a significant role for gold.

Summary

The United States adopted a de facto gold standard in 1834. Thereafter, it adhered to some form of a gold standard with only two extended interruptions, once for 17 years in the 19th century, and again in this century, for 13 years, if one dates the interruption from 1968, when the two-tier London gold market was created; for 10 years, if one dates it from 1971 when convertibility of the dollar, even for official transactions, was formally suspended; for 8 years, if one dates it from 1973, when floating exchange rates were adopted by the United States and the industrial countries. The political objective of returning to the gold standard was achieved in the 19th century case, despite opposition from silver and paper money advocates. Whether that political objective exists or is currently achievable cannot be determined from a retrospective view.

In addition to the two extended interruptions in U.S. adherence to a gold standard, temporary suspension of a few weeks to a year's duration occurred in 1837, 1839, 1857, 1893, 1907, 1917-19, and 1933. In all cases but the latter two, the years in question climaxed periods of economic expansion in the United States, fostered by external as well as internal factors. The pace of the expansions raised U.S. prices and incomes above those prevailing in the rest of the gold standard world. To bring the U.S. price and nominal income structure into alignment with that of its trading partners enforced reductions in the U.S. money stock, usually resulting

from a decline in U.S. gold reserves and in capital imports from abroad. Prices, output, and employment subsequently declined, accompanied by bankruptcies of firms and bank failures. Suspension of specie payments in the years under review was a means of mitigating the costs of deflationary adjustment that maintaining par values of the exchange rate imposed. The devaluation implicit in suspension gave the economy a breathing spell. With recovery, the former par value of the exchange rate was restored.

No special comment is needed on the World War I restriction of interconvertibility between paper money and gold and the free international movement of gold. The situation in 1933, however, does require comment. That year was in no respect similar to the earlier examples of temporary devaluations. 1933 was a year of a business cycle trough after four years of deflation. The deliberate reduction in the gold content of the dollar was arranged to achieve a price rise of nongold commodities, and the devaluation was never reversed. Moreover, the fixed exchange rate gold standard to which the United States returned in 1934 was the same in name only to the pre-1933 gold standard.

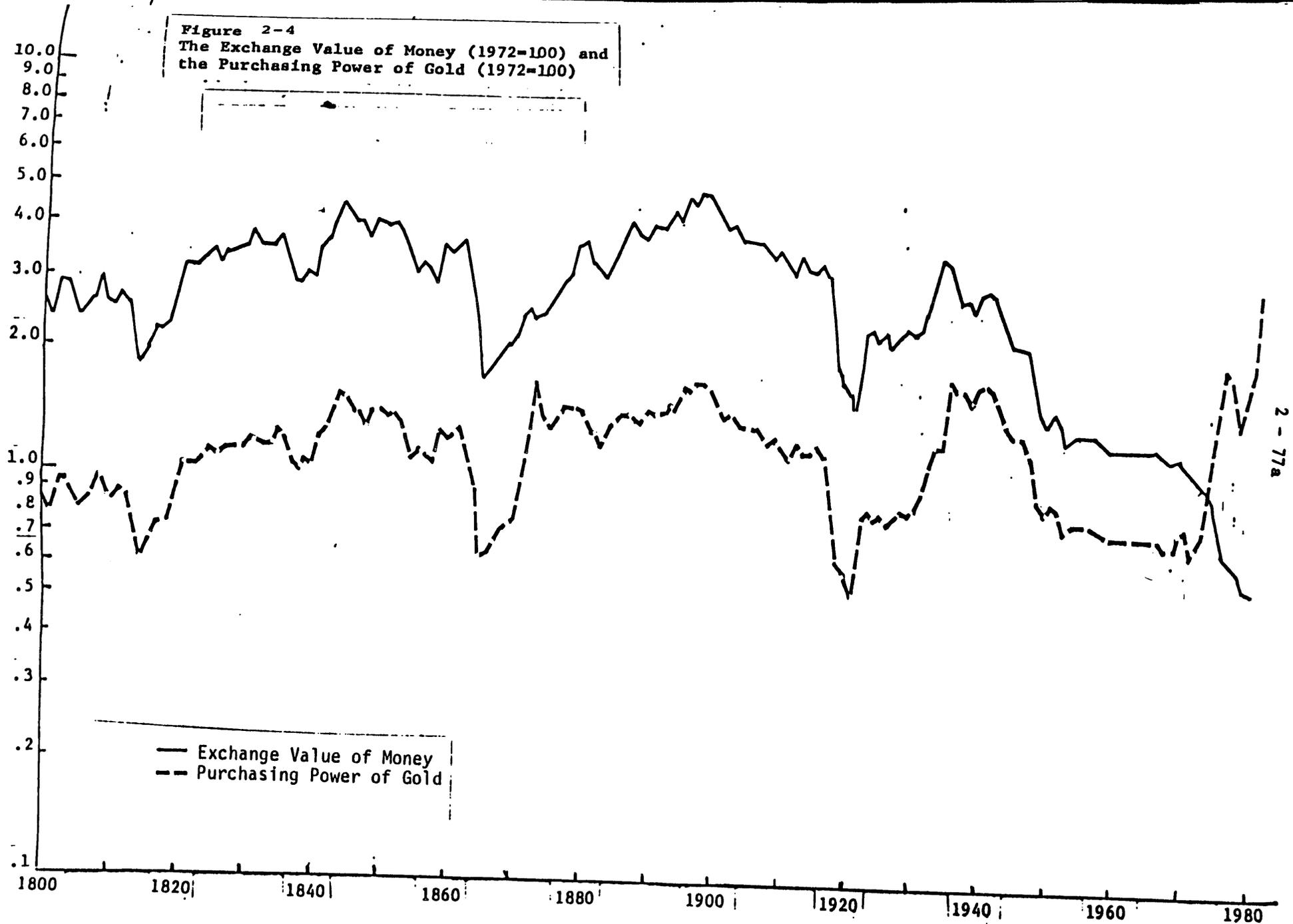
Before 1914, gold flows in and out of the United States were an important determinant of the expansion or contraction of the economy. Between 1919 and 1933, large outflows of gold occasioned contractionary actions by the monetary authorities; small outflows and both large and small inflows of gold were sterilized. After 1934, both inflows and outflows were not permitted to determine monetary growth and the performance of the economy. When the gold reserve ratios applicable to

Federal Reserve deposits and notes were close to the minimum legal requirement, the minimum was lowered and eventually abolished. Gold became a symbol rather than an effective constraint on the operation of the monetary authorities.

Figures 2-1 and 2-2 summarize the evidence on the performance of the economy; Figures 2-3 and 2-4, evidence on the purchasing power of gold, whether the gold standard was suspended or in effect.

Trend movements in prices are the most striking feature of Figure 2-1. From 1834 to 1861, a mild downward trend prevailed, with pronounced cyclical upswings and downswings around the trend. The greenback period from 1862 to 1878 shows the sharp wartime price rise to 1865 followed by a decline of equal magnitude spread over the years to the close of the period. That decline persisted during the gold standard period to 1896, reflecting the disparity between the rate of growth of the monetary gold stock and the enlarged world demand. The reversal of the downward trend from 1896 to 1914 reflects the dramatic increase in world gold output during that period. World War I, like the Civil War period, shows a steep price increase to 1920, followed by the steep price decline from 1920 to 1921, rough stability during the 1920s, and then the great deflation of 1929-33 that restored the wholesale price series to its pre-World War I level, the implicit price deflator to a somewhat higher point than the pre-World War I level. The contraction of 1937-38 is apparent in the post-1933 upswing which continues into and beyond World War II. The wholesale price series shows rough stability in the early 1960s, whereas the implicit price deflator continues an upward movement. Both series

Figure 2-4
The Exchange Value of Money (1972=100) and
the Purchasing Power of Gold (1972=100)



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accelerate after the mid-1960s.

Figure 2-2 plots the deviations of real per capita income from its long-run trend. The trend has been strongly positive from 1870 to 1980, as might be expected. There was substantial variance about the trend before 1914 but far smaller in magnitude than from 1914-47, reflecting the sharp swings in the three interwar deep depressions, 1920-21, 1929-33, 1937-38, as well as the wartime movements. However, the pre-World War I variance was marginally greater than the variance of the deviations from trend post-1948. A comparison of the standard deviations of year-to-year percentage change in real per capita income also shows little difference between the pre-World War I gold standard experience and post-World War II experience: 5.8 percent vs. 5.5 percent. Unemployment was on the average lower in the pre-1914 period than in the post-World War I period; 6.8 percent vs. 7.5 percent. But a gain, excluding the interwar years, unemployment 1946-80 averaged 4.8 percent, reflecting the government's commitment to maintaining employment.

Figure 2-3 compares the purchasing power of gold, derived in index form from the quotient of the price of gold divided by the wholesale price index, compared with the U.S. monetary gold stock. Under the gold standard, a rise in the purchasing power of gold ultimately increased the growth of the U.S. monetary gold stock by raising the rate of world gold output, and inducing a shift from nonmonetary to monetary use of gold. Movements in the purchasing power of gold thus preceded long-term movements in the monetary gold stock. This relationship underlay the reversion of the price level towards stability under the gold standard. Price increases

or decreases tended to be reversed after a run of years. Persistent inflation of post-World War II experience, without a force to reverse the trend, could not have occurred under a fully functioning gold standard. The absence of this positive association after World War II between the purchasing power of gold and long-term movements in the monetary gold stock reflects the loosening of the link between the money supply and the gold stock.

Over shorter periods, the relationship under the gold standard was in the opposite direction. Changes in the monetary gold stock, by influencing changes in the money supply, produced a negative association between the purchasing power of gold and the gold stock. Thus an increase in the gold stock would lead to an increase in the price level and, for a given nominal price of gold, lower the purchasing power of gold. The negative association may be observed during the gold standard period, changes in the monetary gold stock leading short-term movements in the purchasing power of gold.

Figure 2-4 compares the exchange value of money, computed as the reciprocal of the wholesale price index, with the purchasing power of gold. The two series are closely related until 1968, when the two-tier market for gold was introduced. The direct relationship until 1968 reflected the existence of a fixed nominal price of gold. The inverse relationship thereafter reflects the increase in private demand for gold as a hedge against inflation and political instability, once private transactions were determined in the free market.

To conclude: The gold standard provided long-term but not short-term

price predictability. Long-term inflation or deflation under the pre-World War I gold standard would predictably be reversed as gold output was discouraged or encouraged by decreases or increases in its purchasing power. Thus the price level tended to revert toward a long-run stable value under the gold standard, providing a degree of predictability with respect to the value of money. Subsequent to World War I, the discipline of the gold standard came to be regarded as an impediment to the management of the economy to achieve the objectives of growth and high employment. The deep depressions of the inter-war years were the measure by which the economy under a gold constraint was judged to be a failure. The loosening of the link to gold after World War I and its abandonment fifty years later reduced long-term price predictability. Belief in long-term price stability eroded as public perception of the absence of a long-run constraint on monetary growth took hold. Although price stability was generally included among the goals of the post-World War II era, in fact stability of employment took precedence. In the event, by early 1981, neither goal was in sight.

Notes to Chapter 2

1. Act of April 2, 1972, sec. 9, in National Monetary Commission Laws of the United States Concerning Money, Banking, and Loans, 1778-1909 [Laws], Washington: Government Printing Office, 1910, p. 475.
2. J. L. Laughlin, The History of Bimetallism in the United States, 4th ed., New York: Appleton, 1901, pp. 51, 57.
3. Laws, p. 496.
4. Laughlin, op. cit., pp. 64-71.
5. Act of January 13, 1837, in Laws, p. 502.
6. Laughlin, op. cit., p. 77. See also David A. Martin, "1853: The End of Bimetallism in the United States," Journal of Economic History 33 (December 1973): 825-44. Laughlin dates the 4 percent premium on silver coins as of 1953; Martin dates it as of 1851.
7. Laws, p. 512, The Act of Feb. 21, 1853, states the standard weight of silver in a 50-cent coin as 192 grams, which is equivalent to 172.8 grams per one-half a fine troy ounce.
8. Laws, p. 508.
9. Laws, p. 574.
10. Laughlin, op. cit., pp. 118-20; J. E. Cairnes, Essays in Political Economy: Theoretical and Applied, London: MacMillan, 1873, p. 142.
11. George Macesich, "Sources of Monetary Disturbances in the U.S., 1834-1845," Journal of Economic History 20 (September 1960):

- 407-34; Peter Temin, The Jacksonian Economy, New York, Norton, 1969, pp. 28-82, 138-39.
12. R. H. Timberlake, Jr., The Origins of Central Banking in the United States, Cambridge, Harvard University Press, 1978, Ch. 5, "The Specie Circular and Distribution of the Surplus," pp. 50-62; Temin, op. cit., pp. 120-136.
13. Temin, op. cit., 113-20; 141-47.
14. Bray Hammond, Banks and Politics in America from the Revolution to the Civil War, Princeton, Princeton University Press, 1957, pp. 707-17.
15. U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 1, Series E-52, p. 201.
16. These are unpublished partial estimates of GNP in 1860 prices, constructed by Robert E. Gallman. The estimates are partial because they do not include the change in inventories. It is for this reason that the annual rates of change do not show the cyclical movements of the economy. Those movements are dominated by change in inventories. An alternate real income series, in 1929 prices, is available in Thomas Senior Berry, Estimated Annual Variations in Gross National Product, 1789 to 1909 (Richmond, Bostwick Press, 1968). Annual rates of change of these estimates (shown there in Table 1, col. 3, p. 32) are: 1834-37 (+5); 1837-38 (-1); 1838-56 (+4.6); 1856-57 (-8); 1857-59 (+6).
17. This section draws heavily on Milton Friedman and Anna J. Schwartz,

- A Monetary History of the United States, 1867-1960 [History], Princeton, Princeton University Press, 1963, pp. 15-88.
18. Report and Accompanying Documents of the United States Monetary Commission Organized Under Joint Resolution of August 15, 1876 [44th Congress, 2d Sess., Senate Report No. 703], Washington, G.P.O., 1877, vol. 1, pp. 1-160.
19. Timberlake, op. cit., Ch. 8, "The Panic of 1873 and Resumption," pp. 108-119.
20. See Friedman and Schwartz, History, pp. 89-188.
21. Sources of wholesale prices: 1800-1889, U.S. Bureau of the Census, Historical Statistics, Series E-52, pp. 202-203, shifted from 1910-14 to 1972 base; 1890-1970, ibid., Series E-23, p. 199, shifted from 1967 to 1972 base; 1971-1979, U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, December 1980, Bulletin 2070, Table 140, p. 334, shifted from 1967 to 1972 base; 1980, Survey of Current Business, August 1981, pp. 5-7, producer prices, all commodities, shifted to 1972 base.
22. Source of monetary gold stock: 1875-1878, Phillip Cagan, Determinants and Effects of Changes in the Stock of Money, 1875-1960, New York, Columbia University Press for NBER, 1965, Table F-7, p. 340; 1879-1913, Friedman and Schwartz, History, Table 5, col. 1, p. 131, Table 8, col. 1, p. 180; 1914-41, Board of Governors of the Federal Reserve System, Banking and Monetary Statistics, 1914-1941, 1943, p. 536, plus \$237 million deducted by the source restored annually 1914-33, and 1934-41 figures

recalculated at \$20.67 per ounce instead of at \$35; Banking and Monetary Statistics 1941-1970, p. 899, recalculated; 1971-1980, Federal Reserve Bulletin, Dec. 1976, p. A59, Dec. 1978, p. A55; Aug. 1981, p. A53, recalculated. Purchasing power of gold: See Statistical Compendium below.

23. Sources of real per capita income: Derived from a nominal income series; population; and a price deflator implicit in net national product in Milton Friedman and Anna J. Schwartz, Monetary Trends in the United States and the United Kingdom, 1867-1975 (in press), Ch. 4, extended 1976-80, in the same way as the figures were constructed for preceding years. The price deflator, in 1929 prices in the source, has been shifted to a 1972 base. The trend line shown on Figure 2-2 was derived as follows:

$$\log y = 6.58 + 0.016687 \text{ time},$$

(316.1) (52.9)*

where y = real per capita income.

$$\begin{aligned} R^2 &= .962 \\ SEE &= .10 \\ D.W. &= .342 \end{aligned}$$

An alternative series that was discussed at one of our meetings is a Bureau of Labor Statistics series of real net spendable weekly earnings of a worker with three dependents. This series diverges markedly from 1962 on from a series of real per capital disposable personal income, showing a progressively steeper decline that does not characterize the real per capita disposable personal income series (or the real per capital income series).

As an article by Paul Ryscavage, "Two divergent measures of

purchasing power," Monthly Labor Review, Aug. 1979, pp. 25-30, explains, the real earnings series is a faulty measure. It is constructed from estimates of average hourly earnings and average weekly hours of both full-time and part-time workers. The two estimates are multiplied to obtain average weekly earnings. From the gross average figure, the BLS deducts the social security tax and the Federal income tax liability applicable to a married worker with three dependents. The Consumer Price Index is then divided into the net spendable earnings to arrive at real net spendable earnings.

The key problem with the series is the measure of gross average weekly earnings. It includes not only weekly earnings of men, the majority of whom work full time, but also the weekly earnings of women and teenagers, many of whom work part time. The earnings of the latter two classes of workers pull down the overall average for production and nonsupervisory workers.

Since the series of real net spendable weekly earnings of a worker with three dependents is not based on earnings data for a worker with these characteristics, it does not provide a reliable measure of his economic well-being, as the BLS acknowledges.

At the Hearings we conducted on November 13, Professor Roy Jastram suggested that "the use of real per capita income as a measure of the comparative fluctuations in the economy with and without the gold standard" was misleading. Specifically, he argued that unionization of labor and the growth of transfer payments since 1934 tended to diminish declines in real per capita income thereafter.

Since transfer payments do not raise aggregate real incomes, it is hard to see why per capital results would be affected. Unionization might have increased instability insofar as it reduced income for those not covered by unions. In any event we reject Professor Jastram's suggestion that manufacturing production is a more even-handed measure of the severity of cyclical movements in both gold standard and post-gold standard periods. Since manufacturing production has declined relative to aggregate GNP, it is a statistically biased measure of economic well-being over the past half century.

24. Friedman and Schwartz, History, pp. 189-406.
25. Ibid., pp. 462-71.
26. Ibid., pp. 471-76; 508-11; 550-51.
27. Arthur I. Bloomfield, Capital Imports and the American Balance of Payments, 1934-39, Chicago: University of Chicago Press, 1950, pp. 158-66.
28. During the first nine months of 1937, the Treasury did not use the cash balances it could create on the basis of the gold it bought. Instead, it paid for the gold by borrowing from the public and the banks. What the Treasury took from the public and the banks by the sale of securities offset what it paid to the public and the banks by the purchase of gold. Accordingly, high-powered money did not reflect the growth of the gold stock.

The operation was economically identical with the sterilization

actions of the Federal Reserve in the 1920s, when the System sold bonds on the open market to offset the increase in high-powered money that would otherwise have arisen from a gold inflow. The Treasury program became effective at about the same time the Federal Reserve was imposing two increases in reserve requirements on member banks (on March 1 and May 1, 1937; an earlier increase was imposed in August 1936). The sterilization program sharply reinforced the effect of the rise in reserve requirements in producing monetary restrictiveness: the rise in reserve requirements increased the demand for high-powered money; simultaneously the Treasury's action virtually brought to a halt an increase in high-powered money which had been proceeding with only minor interruptions since 1933.

A start toward desterilization was made in September 1937, when the Board of Governors of the Federal Reserve System requested the Treasury to release \$300 million from the inactive gold account. The Treasury released the amount requested by the Federal Reserve, but it continued to sterilize all further gold purchases, which amounted to \$174 million in that month. Hence inactive gold held by the Treasury fell only \$126 million in September 1937.

As of January 1, 1938, the Treasury limited the addition to the inactive gold account in any one quarter to the amount by which total gold purchases exceeded \$100 million, and on April 19, 1938, discontinued the inactive gold account, which then amounted to about \$1.2

billion. In the first half of 1938, accordingly, there was a more rapid increase in high-powered money than in the gold stock. The Treasury printed gold certificates corresponding to some of the inactive gold in the Treasury, deposited the certificates at the Reserve Banks, and drew on the balances it thus established to pay government expenses or to redeem debt. The operation was essentially an open market purchase of securities undertaken at Treasury initiative.

Initially, the shift of inactive gold from Treasury cash to Treasury deposits at the Federal Reserve Banks had no immediate monetary effect. Effective desterilization did not occur until more than a year after formal desterilization. Only after February 1939 did the sum of Treasury cash holdings and deposits at Reserve Banks decline toward the level that had prevailed before the sterilization program.

29. This section draws heavily on Chapter 2 of The International Transmission of Inflation (in press) by M. R. Darby, J. R. Lothian, A. E. Gandolfi, A. J. Schwartz, and A. C. Stockman.
30. See "Treasury and Federal Reserve Foreign Exchange Operations," in Federal Reserve Bulletin, Sept. 1962, pp. 1138-53.
31. Margaret G. de Vries, The International Monetary Fund 1966-1971: The System Under Stress, Washington, D.C. 1976, Part Five, "Exchange Rates in Crisis," pp. 432-48.
32. For a description of the controls that were imposed, see International Monetary Fund, Annual Report on Exchange Restrictions, various editions.
33. Lance Girton argues that the emphasis upon international liquidity during this period and the subsequent introduction of SDRs stemmed

- from the application of the real-bills doctrine to the international monetary system. See his "SDR Creation and the Real-Bills Doctrine," Southern Economic Journal 41 (July 1974): 57-61. The real-bills doctrine is the notion that if banks restricted their advances to the nominal value of trade, the money supply would have a desirable elasticity. In fact, it would become unstable. The fallacy in the doctrine is that it sets no effective limit to the quantity of money.
34. By the end of the fourth quarter of 1972, the value of SDRs was slightly over \$9.4 billion or 6 percent of total world international reserves as reported in International Financial Statistics, July 1974.
35. IMF, Annual Report, 1975, p.44.
36. See Annual Report of the Secretary of the Treasury on the State of the Finances, 1978, p. 491, Exhibit 60, a press release on the increase in the amount of gold sales, announced Aug. 22, 1978 ("The sales will make an important contribution toward reducing the U.S. balance of payments deficit on current account") and Exhibit 61, a statement by Assistant Secretary Bergsten before the Senate Committee on Banking, Housing and Urban Affairs, in which the quotation in the text appears.
37. Only \$42.22 of the price obtained for every ounce the Treasury auctioned was applied to the retirement of gold certificates.
The balance was applied to the Treasury's General Fund.
38. Board of Governors of the Federal Reserve System, 61st Annual Report, 1974, pp. 65-66.
39. The first guideline stated: "A member with a floating exchange rate should intervene on the foreign exchange market as necessary to prevent or moderate sharp and disruptive fluctuations from day to day and

from week to week in the exchange value of the currency." A second guideline encouraged intervention to moderate movements from month to month and quarter to quarter "where factors recognized to be temporary are at work." A third guideline suggested consultation with the fund if a country sought to move its exchange rate "to some target zone of rates." A fourth guideline dealt with the size of a country's reserves relative to planned intervention; a fifth, with avoiding restrictions for balance of payment purposes; a sixth, with the interests of other countries than the intervening one. IMF Annual Report, 1974, pp. 112-116.

40. The index of weighted average exchange values of the dollar against the "G-10" countries plus Switzerland (March 1973=100) declined at an average annual rate of 9.3 percent between January and November 1978. From January 1976 to January 1978, it had declined at a 3.3 percent annual rate.
41. The price of gold from the end of 1973 to the end of 1980 increased at an average annual rate of 20.7 percent. By comparison, the total returns on common stock and on long-term corporate bonds increased at average annual rates of 7.2 percent and 4.0 percent, respectively. (These figures appear in R. G. Ibbotson and R. A. Sinquefeld, "Stocks, bonds, bills and inflation: Year-to-year historical returns (1926-1974)"; "Simulations of the Future (1976-2000)" in Journal of Business 49, Jan. 1976, pp. 11-47, and July 1976, pp. 313-138.) The U.S. CPI over this period increased at a rate of 7.8 percent per year on average and the London Economist's world commodity price index increased at a 9.5 percent rate.