Federal Reserve Bank of New York

Quarterly Review

Winter 1980-81 Volume 5 No. 4

The Quarterly Review is published by the Research and Statistics Function of the Federal Reserve Bank of New York. An "In Memoriam" honoring JOHN HENRY WILLIAMS *(1887-1980) begins on page 1. Among the members of the function who contributed to this issue are* MARCELLE ARAK *(on inflation and stock values, page 3);* JAMES R. CAPRA *(on analyzing how fast Federal budgetary expenditures can be reduced, page 14);* WILLIAM J. GASSER *(on the outlook for global payments problems in 1981, page 30);* PAUL BENNETT, HAROLD COLE, *and* STEVEN DYM *(on oil price decontrol and beyond, page 36); and* PAUL WACHTEL *(on social security and savings behavior, page 43).*

An interim report of Treasury and Federal Reserve foreign exchange operations for the period August through October 1980 starts on page 50.

In Memoriam
John Henry Williams
1887-1980

John H. Williams was the rare combination of the scholar, outstanding in academic pursuits, and the active practitioner of the art of central banking. Familiar with the evolution of economics, the bulk of his career was concerned with the application of that discipline to public policy.

Born in Ystrad-gynlais, Wales, his parents emigrated to the United States when he was an infant. The family settled in North Adams, Massachusetts, where John grew up. After earning his bachelor's degree in 1912 from Brown University, he taught English there until 1915. In that year he married Jessie Isabelle Monroe, by whom he was to have two daughters and, already in his late twenties, began the study of economics at Harvard. There he won a Ph.D. and the Wells Prize for his classic study on Argentine trade. After teaching at Princeton and Northwestern, he returned in 1921 to the faculty of Harvard, where he remained until his retirement in 1957.

A distinguished academic career soon brought him national recognition. In 1932, at the nadir of the Great Depression, he was appointed a member of the United States delegation to the Preparatory Committee for the World Monetary and Economic Conference. In the spring of the following year, when the conference was about to open, he joined this Bank as Assistant Federal Reserve Agent and immediately became involved in the efforts to stabilize the exchanges. Deeply concerned with this objective, he remained at the Bank full time until October 1934. Thereafter, he divided his time for more than twenty years between this institution and Harvard where he became, in 1937, the first Dean of the Graduate School of Public Administration. At this Bank, he was appointed in 1936 Vice President in charge of the Research Function to which he attracted many able economists. From 1947 until he reached retirement age in 1952, he served as Economic Adviser, continuing thereafter as consultant to the Bank for another decade. Among posts and honors too numerous to list was his election as President of the American Economic Association in 1951. Two years after the death in 1960 of his first wife, he married Katherine R. McKinstry who survives him.

Although it was his major professional concern, advising on policy never came easily to John Williams. He wrote that he always tried "to look all round a problem rather than to plunge forthwith for the bold solution". His circumspection reflected a deep understanding of the complexity of the problems confronting the authorities. In dealing with these problems, theory was certainly essential. He liked to quote Keynes' view that without theory we are "lost in the woods". But, by its very nature, theory was a simplification of reality. Moreover, the most influential theories were products of unique circumstances and, indeed, had their origins in views about policy growing from those circumstances. In effect, theory was often a rationalization for policy. Since circumstances were constantly changing, he warned that those who drew prescriptions glibly from theory were dangerous as policymakers.

Understanding both the value and the limitations of theory, John Williams was constantly testing hypotheses against the realities of the market. In doing so, he found much to justify his skepticism. He particularly questioned conventional views about the gold standard. The classical specie flow mechanism was a beautiful intellectual construct which, however, failed to

mirror the realities. The international monetary system, which it purported to describe, was in fact one in which Britain maintained a gold standard, while most other countries based their currencies on sterling. He found related faults in classical trade theory which neglected both the dynamic relationship between the center and peripheral countries and also the adjustment difficulties that the spread of manufacturing in the periphery caused for traditional industries in the centers themselves.

His view about the key role played by the industrial and financial centers shaped Dr. Williams' advice about the handling of international monetary problems. In the thirties and forties, much of the world's economic activity was centered in the United States and Britain. Their currencies were the media in which trade and finance were conducted. The problem of exchange instability, which bedeviled the discussions of those years, boiled down to negotiating a mutually acceptable relationship between the dollar and sterling and then maintaining that relation—stable but not immutable—through appropriate domestic policies in the two center countries. Such views clearly influenced the United States Government in the negotiation of the Tripartite Agreement of September 1936. They also were the basis for John Williams' reservations about the Bretton Woods agreements.

These reservations focused primarily on the International Monetary Fund. Dr. Williams criticized numerous aspects of its articles but his major concern was that the Fund, which was designed to help correct relatively modest and temporary international imbalances, would be incapable of performing this function in the very difficult circumstances expected at the end of hostilities. Britain's external difficulties would be particularly severe. Unless "heroic measures"—a continuation of Lend-Lease or a large low-cost loan—were granted by the United States, Britain would not be in a position to cooperate in the reestablishment of a multilateral trade and payments system. Yet, such "heroic measures" were beyond the capacities of the Fund; in their absence, the trade and exchange restrictions that had been erected during depression and war would almost certainly be extended long into the postwar period. Thus, establishment of the Fund would create only a facade of cooperation without the substance. As events developed, measures even more heroic than Dr. Williams had advocated were adopted in the troubled years following the war—the Anglo-American loan, aid to Greece and Turkey, and the Marshall Plan. These, combined with the cooperative efforts of Western Europe, eventually built an international environment in which the Fund could effectively function.

In fulfilling its role throughout this disturbed period, the Federal Reserve benefited greatly from the broad experience and wisdom of John Williams. In 1956, as he approached his seventieth birthday and accepted the need to lighten his professional reponsibilities, this Bank's board of directors expressed its appreciation, stating that

> His wide-ranging knowledge and experience in economic affairs, his sound judgment, and his whole-hearted dedication to the public interest have marked Dr. Williams' contributions to the work of the Federal Reserve System during years of depression, war, and inflation. In addition to the wise counsel he has brought to deliberations, he has been a constant source of encouragement and inspiration to others on the Bank's staff, always generous of his time and wisdom, thus carrying some of his primary vocation into his work at the Bank to its enduring benefit.
>
> If all this were not enough, he will remain long in the memory of his associates at the Bank who treasure him as a true and steadfast friend.

Inflation and Stock Values
Is Our Tax Structure the Villain?

At one time, investors regarded common stocks as a good inflation hedge. Because stocks represented the ownership of real capital, people thought that their value would rise roughly in proportion to the general price level, at least over periods of several years. For the last decade or so, however, stock prices have not kept pace with inflation. The Standard and Poor's index of stock prices, for example, stood at 133 in the fourth quarter of 1980, up only 26 percent from its 1968 fourth-quarter level. Yet, the price level more than doubled in that same period. This meant that the real value of equity fell almost 50 percent.

Why did this tremendous drop in real value of equity occur? Some observers have suggested that inflation itself may account for this phenomenon. One theory is that the tax structure in the United States, particularly that applicable to corporations, becomes more burdensome when the price level rises. As a consequence, a change in inflation can reduce a corporation's real aftertax earnings. This could, in turn, lower the value of owning equity.

This article explores the question of whether the tax system—along with the acceleration in inflation—could account for the poor performance of stock prices. Overall, the analysis indicates that the tax structure may well have played a sizable role in reducing real stock prices. At the same time, the analysis indicates that the tax structure cannot account for the whole decline.

This is a revised version of an article that is part of a forthcoming Federal Reserve System study of the Federal tax structure. I would like to express my appreciation to Patrick Corcoran, Patric H. Hendershott, Patrick Lawlor, Martha Scanlon, Thomas Simpson, and Helmut Wendel for useful comments and suggestions, and to Joseph Snailer for statistical assistance.

A closer look at real stock prices

Stock price averages such as the Standard and Poor's index of 500 common stock prices moved up sharply in the early 1960s and then more slowly from 1966 to 1973 (Chart 1). Then, in 1974, prices plunged. Although they recovered somewhat thereafter, stock prices until very recently remained below their 1973 peak.

In constant dollars, stock price performance was much worse, falling dramatically since 1968 (Chart 2). Real stock prices peaked in the 1965-68 period and then declined through 1970. Although there was some recovery from 1971 through 1973, real stock prices did not regain their previous peak. Then, in late 1973 and 1974, real stock prices dropped precipitously back to their 1954-55 level. They have not since recovered substantially.

How can one explain this phenomenal drop in real stock values? One simple hypothesis is that stockholders were paid dividends in excess of aftertax corporate earnings. In this case, corporations would not have had sufficient funds to replace equipment or structures as they depreciated unless they borrowed. Whether corporations ran down their stock of fixed capital or borrowed to maintain it, the amount of fixed capital owned free and clear by stockholders would decline. The data, however, do not support this hypothesis: in every year from 1967 to 1979, corporations paid dividends smaller than their aftertax "true"

Chart 1

Standard & Poor's Stock Price Index of 500 Stocks

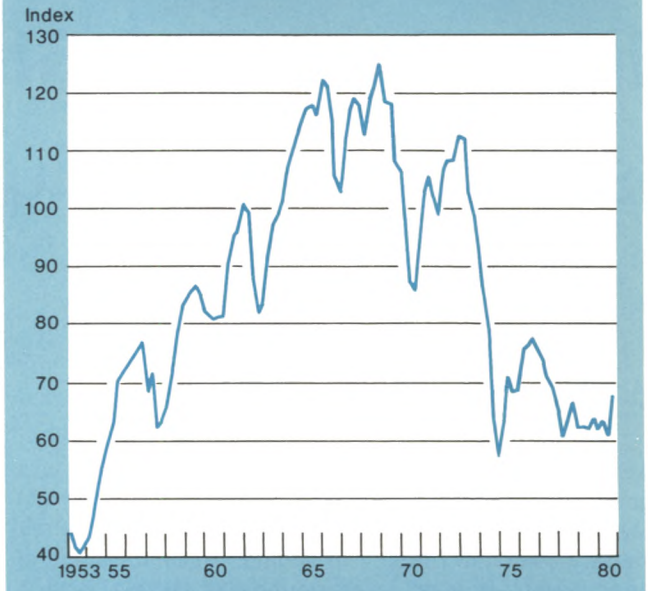
1941-43=10

Source: Standard & Poor's Corporation.

Chart 2

"Real" Stock Prices

Standard & Poor's index deflated by the GNP price deflator



Sources: Standard & Poor's index of 500 stocks: Standard & Poor's Corporation; gross national product implicit price deflator: United States Department of Commerce, Bureau of Economic Analysis.

profits (see glossary). Thus, the stock price per dollar of equity investment, which includes retained earnings, declined even more sharply than the real stock prices shown in Chart 2.

A second hypothesis is that inflation was responsible for the decline in equity values. Here the data do lend support. For example, the acceleration of inflation in the seventies (Chart 3) does coincide roughly with the deterioration of real stock values. Moreover, statistical analyses over long periods of time indicate that stock prices were negatively correlated with the rate of inflation.[1] Other statistical studies show that the returns to equity—which may have been reflected in equity values—were also negatively affected by inflation.[2] All this evidence suggests a negative correlation between inflation and stock values. However, it does not explain the linkage. One explanation of the linkage is that the structure of the tax system reduces equity returns when inflation accelerates.

Tax nonneutrality as an explanation of stock prices

A tax is "neutral" with respect to inflation if it collects the same tax monies, in real terms, from a given amount of real income regardless of the price level. That is, the taxation ratio associated with a given real income does not change with inflation. Both the personal income tax and the corporate income tax codes in the United States contain features that are not neutral. For example, the marginal tax rate brackets of

[1] See Franco Modigliani and Richard A. Cohn, "Inflation, Rational Valuation and the Market", *Financial Analysts Journal* (March/April 1979); Bruno Oudet, "The Variation of the Return on Stocks in Periods of Inflation", *Journal of Financial and Quantitative Analysis* (March 1973); and John Lintner, "Inflation and Security Returns", *Journal of Finance* (May 1975).

[2] See Eugene F. Fama, "Stock Returns, Real Activity, Inflation and Money", Graduate School of Business, University of Chicago Working Paper (1979).

the personal income tax are based upon dollar income rather than real income. If tax rates are unchanged, a proportional rise in prices and nominal incomes will put taxpayers in higher marginal tax brackets and their taxes will rise more than in proportion to prices. As a result, a larger percentage of their income will be paid in taxes even though their real income is no higher. Also, the dollar value of realized capital gains is taxed even if the asset did not appreciate in real terms, *i.e.,* no additional purchasing power was achieved.

At the corporate level, the Federal tax code has two main features that cause an increase in the tax burden when prices accelerate: (1) "nominal" inventory profits are taxable[3] and (2) allowable depreciation is based upon the original, rather than the replacement, cost of equipment and structures.

Inventory profits

Corporations are taxed on total *nominal inventory profits.* Like capital gains, inventory profits are taxed even if the goods do not appreciate in real terms. The value of inventories is typically computed by using one of two accounting methods: "first in-first out" (FIFO) or "last in-first out" (LIFO). For a corporation using FIFO, the oldest item in inventory is assumed to be the first sold. The value of a fixed volume of raw materials, say, will rise as "old" items are taken from inventory and new higher priced ones are added. In contrast, for corporations using the LIFO procedure, the item inventoried most recently is the one assumed to be removed from inventory and replaced with a newly produced item. The inventory profit calculated by this method is typically small, unless a firm liquidates an extensive portion of its inventory. As a consequence, firms have an incentive to switch to LIFO and some of them did switch, particularly in 1973-74. Many more, however, were reluctant to do so, perhaps because of costs entailed in making the switch or because they feared that their stock price would decline if they implemented an accounting change which reduced reported profits even though increasing true aftertax profits. On balance, only a small proportion of the inventory profits are computed on a LIFO basis and, in aggregate, inventory profits are therefore substantial in an inflationary period. For example, inventory profits soared in 1973-74 and again in 1979 when inflation accelerated (Chart 4). As a consequence of this link between inventory profits and inflation, the tax burden associated with inventories increases in real terms when inflation accelerates.

[3] There is no easy way to calculate true inventory profits.

Depreciation allowances

Corporations are permitted to deduct allowances for depreciation of their fixed capital—structures and equipment—in computing their taxable income. These allowances are based upon the "service life" of the capital good, as specified by the Internal Revenue Service (IRS), and the *original* cost of the capital good. The service lives set out by the IRS are generally shorter than the useful service lives of capital goods. Thus, capital goods can be depreciated faster than they wear out. When prices are rising, however, the depreciation allowances that are permitted, based upon original cost, will understate the true cost of replacing capital goods. And the more rapidly the price level is projected to increase, the smaller is the anticipated present value of the depreciation allowances on a new capital good. For example, when the inflation rate is 8 percent, a corporation is permitted to deduct only 53 percent of the "true" depreciation on a thirty-year structure (Table 1).

Debt

While the Federal code taxes nominal capital gains, which may not represent an increase in the general purchasing power of the asset, some implicit real

Glossary

Cash flow is defined as profits before taxes plus capital consumption allowances plus net interest paid.

A *neutral tax* (in an inflationary sense) collects the same monies, in real terms, from a given amount of real income regardless of the price level.

Reported profits (after taxes) are corporate taxable income less corporate tax liability.

Adjusted profits are reported profits minus (a) inventory profits and (b) a correction factor to put depreciation on a replacement-cost basis.

True profits are adjusted profits plus the reduction of the real value of net outstanding financial debt due to inflation.

True profitability is the ratio of true profits to capital, valued at replacement cost, less the market value of net debt.

The *rate of return on total capital* is calculated as the ratio of total adjusted capital income—interest plus aftertax profits, adjusted to eliminate inventory profits and to reflect depreciation on a replacement-cost basis —to the replacement cost of capital.

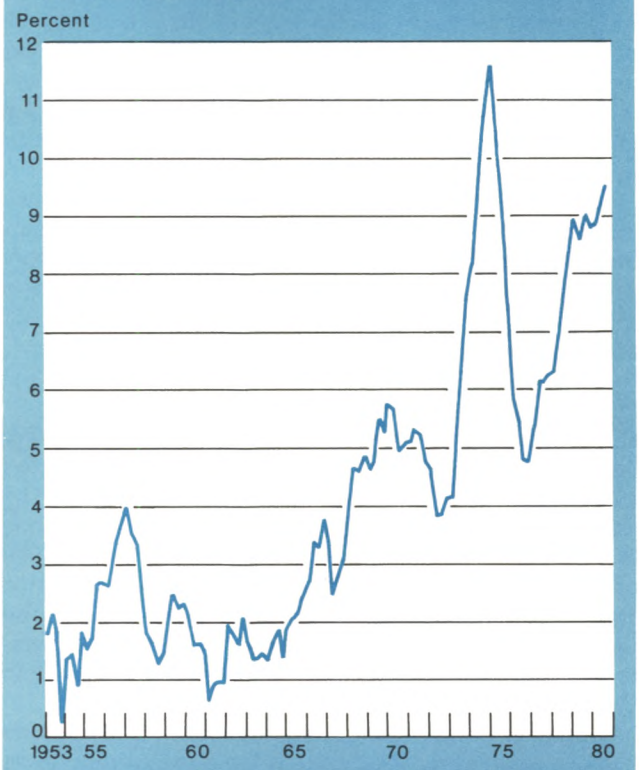
capital gains are not taxed. Consider, for example, the real value of a corporation's financial debt. Whenever the price level increases unexpectedly, the real value of the corporation's outstanding debt declines and the shareholders' real wealth increases. Yet there is no tax on this real gain. (Unexpected inflation would cause some wealth shift toward debtors even if part of it were taxed.)

Second, a change in the anticipated rate of inflation that affects nominal rates of interest may also benefit shareholders in a firm which has net debt outstanding.[4] Suppose, for example, that the expected rate of inflation rose by 1 percentage point. To earn (or pay) the same real rate of interest, the *aftertax nominal yield* would have to rise by 1 percentage point in order to offset the inflation increase. A creditor in a 25 percent marginal tax bracket would require an interest rate increase of 1⅓ percentage points to net 1 percent more after taxes [(1 − .25) (1⅓) = 1]. The corporation in a 46 percent tax bracket, in contrast, would require a 1.85 percentage point increase in the nominal bond rate to pay 1 percentage point more after taxes [(1 − .46) (1.85) = 1]. Any smaller increase in the nominal rate of interest would improve its real income. Therefore, if the interest rate increased by 1⅓ percentage points, just enough to maintain the real aftertax earnings of the recipient of interest, the corporation's real aftertax cost would decline.

Chart 3

Growth Rate of GNP Price Deflator

From four quarters earlier



Source: GNP price deflator from United States Department of Commerce, Bureau of Economic Analysis.

To summarize, inflation influences the aftertax real income of stockholders, reducing it through the generation of taxable nominal capital gains and nominal inventory profits, as well as through the reduction of the real value of depreciation allowances, and increasing it through the tax treatment of debt and debt servicing.

Can we say on balance how large an effect inflation has had on the value of stockownership? First, let us define precisely what we mean by "inflation". For purposes of computing the impacts on real stock values, three different cases must be distinguished:

- the occurrence of inflation that was expected,
- the occurrence of more inflation than was expected, and
- an increase in the rate of inflation expected to prevail in the future.

[4] There are two parts to this argument. The first concerns the tax treatment of interest and the second the difference between the tax rates of the corporation that pays interest and the individual who receives it.

In general, the real cost of borrowing after taxes and inflation is: $r - p - T$, where r is the nominal interest rate, T is the reduction of taxes permitted because of the interest payment, and p is the expected annual percentage decline in the real value of the principal that is owed. A tax which is neutral with respect to the rate of inflation would allow a deduction of the real interest cost $(r - p)$ per dollar of debt. The aftertax cost would therefore be $(1 - t_c)(r - p)$, where t_c is the corporate tax rate on marginal income. One way of looking at this neutral tax system is that it allows all interest to be deducted but counts the reduction of the real value of the debt as taxable corporate income. (That is, the aftertax real cost could be written as: $r - rt_c - p + t_c p$, which is identical to the neutral tax formula shown a few lines above.) In the United States tax system, however, nominal interest payments, rather than real interest payments are tax deductible. The aftertax real cost of a dollar of debt to the corporation is therefore: $(1 - t_c)\, r - p$. From the viewpoint of the interest recipient, a neutral tax system would apply the marginal tax rate to the real interest earnings. The recipient, under a neutral tax, would therefore be left with $(1 - t_p)(r - p)$ after taxes and inflation, where t_p is the personal tax rate on marginal income. But, under the United States Federal tax code, nominal interest is fully taxed, so that after taxes and inflation the earnings per dollar of principal are: $(1 - t_p)\, r - p$. If the inflation rate went up by 1 percentage point, the interest recipient would be at least as well off providing the nominal rate of interest increased by more than $1/(1 - t_p)$ while the corporation would be at least as well off providing the interest rate increased by less than $1/(1 - t_c)$.

Table 1

The Present Value of Statutory Depreciation Allowances Relative to the Present Value of Price-Level-Adjusted Depreciation Allowances

In percent

Inflation rate	Ten-year equipment* Sum-of-years digits	Ten-year equipment* Straight-line	Thirty-year structure* Straight-line
0	102	108	111
2	95	100	88
4	88	93	73
6	83	87	61
8	77	82	53

* Statutory lifetimes.

Statutory depreciation allowances are based on the sum-of-years digits formula for equipment and the 150 percent declining-balance formula for structures. (For structures, a switch is made to the straight-line formula in the eleventh year, so that the present value of statutory allowances is as large as possible.) The statutory allowances for both equipment and structures use the stated lifetimes. The alternative sum-of-years digits and straight-line allowances for equipment and the straight-line allowances for structures are based on price-level-adjusted depreciation formulas extending over lifetimes 25 percent longer than the statutory lifetimes.

The entries in the table are ratios of the present value of the statutory allowances and their price-level-adjusted alternatives. The real aftertax discount rate is 3 percent.

Source: Taken from Richard Kopcke, "Are Stocks a Bargain?", *New England Economic Review* (May/June 1979).

Each of these events should in principle have a different effect on stock prices. When expected inflation occurs, the real valuation of the firm should not be affected; any effect on anticipated real earnings should have altered equity valuation when the anticipation was formulated.[5]

Unexpected inflation, in contrast, can alter the real value of the firm's equity when it occurs since its impact on real tax liability was not anticipated. For example, this inflation would give rise to a once-and-for-all nominal inventory profit on which corporate tax must be paid. In addition, it would cause a loss in the real value of the depreciation allowance on capital purchased prior to the unexpected price rise. Tending to offset these negative effects is the unexpected reduction of the real value of the firm's outstanding debt.

A change in the expected rate of inflation affects real tax liabilities in ways similar to those from unexpected inflation—through the creation of inventory gain and the understatement of depreciation. However, in this case, both of these effects are ongoing. (Note that, in the case of an unexpected price rise, there is a one-time loss on existing fixed capital only. New equipment, purchased at the higher price level, would have a depreciation allowance that is the same percentage of replacement cost as was typical prior to the unexpected price level rise.) In addition, stockholders can anticipate that the accrued nominal capital gain between any two future points of time will be larger if the price level is expected to rise more rapidly. Should they sell, the realized capital gain and their personal tax liability would be larger in the higher inflation case.

It is possible to obtain a rough idea of the maximum effect of a change in the expected rate of inflation by examining the formula for the rate of return and figuring how much it would be affected by inflation working through each tax feature.[6] For example, the present value of depreciation allowances can be expressed as a function of the rate of inflation. How much a change in the rate of inflation impacts the present value of depreciation allowances can therefore be calculated. The effect on depreciation allowances can then be translated into the effect on taxes and into the effect on aftertax income.

The percentage impact on stockholder returns is an upper limit of the possible percentage impact on real stock prices. If there are other assets whose real returns are unaffected and these assets were available in unlimited supply, then stock prices would have to fall enough to produce the same real return on equity as prevailed before the inflation increase. That is, stock prices would have to fall as much as the real return. Suppose, on the other hand, there were few alternative assets. At the same time, the public wanted to maintain the same stock of accumulated wealth despite the lower returns. In this case, there could be no attempted shift out of equities and the public would simply end up accepting a lower return on stocks. In addition, my estimates overstate the impact because:

[5] The real value of equity equals the present discounted value of expected future real earnings. To the extent that actual dividends are less than the permanent level of dividends (where permanent dividends are defined as that constant level which has the same present value as the stream of aftertax corporate profits), the real value of the firm will rise over time. In the case where dividends are equal to permanent aftertax profits, the real value of the firm should remain constant.

[6] These calculations assume no change in the capital intensity of production and no change in the firm's debt/equity ratio.

(1) The investment tax credit, which has been greatly increased since its inception, is not figured into my calculations. This would offset part of the negative effects on stock values.
(2) Taxes have been reduced on average partly in response to inflation-caused rises in revenues. Therefore, figuring the impact while holding the tax structure constant will overstate the net effect.
(3) There has been a shift away from straight-line depreciation to accelerated depreciation, a reduction of permissible service lives for the calculation of depreciation deductions, and a shift from FIFO and LIFO. All these changes tend to reduce the impact of inflation on stock values.

The results of the calculations for a change in the expected rate of inflation are displayed in Table 2, first column. My estimates show that the prescribed rules for depreciation allowances are the tax element with the largest impact. Indeed, a 4 percentage point rise in the expected rate of inflation could lower stock values by 11 percent through this one tax feature. The taxation of inventory profits and the taxation of capital gains at the individual level each account for about a 5 percent fall. Working in the opposite direction, the real interest rate effect could raise the return by about 5 percent, offsetting about one quarter of the negative effects of the other three tax features.

The effects of a once-and-for-all bout of unexpected inflation are shown in Table 2, last column. Because unexpected inflation is not reflected in the interest rate, the gain to the firm from the reduction of the real value of outstanding debt is not offset by higher interest payments on that old debt. (In the case of a change in inflationary *expectations,* the interest rates would be higher, limiting the gain to the firm.) This large positive benefit from inflation washes out almost all negative effects of inflation on inventory profits and the understatement of depreciation allowances.

Altogether, a 4 percentage point increase in the expected rate of inflation could lower real stock prices by as much as 17 percent. The expected rate of inflation has probably risen by 6 percent over the past decade. According to my calculations, the increase in the expected rate of inflation coupled with our tax system could have caused a 25 percent decline in real stock prices. Therefore, of the 50 percent decline in real stock prices in the past decade or so, the tax structure could account for as much as half. Although this suggests that the tax structure may have had a significant effect on stock values, clearly it is not a full explanation. Indeed, at least half of the decline in stock values remains to be explained by other factors.

Kopcke and Feldstein, Green, and Sheshinski (FGS) also evaluated the impact of inflation on stockholders' returns.[7] Kopcke calculated the effect of the same four tax elements that I examined, obtaining estimates

[7] Richard Kopcke, "Are Stocks a Bargain?", *New England Economic Review* (May/June 1979); Martin Feldstein, Jerry Green, and Eytan Sheshinski, "Inflation and Taxes in a Growing Economy with Debt and Equity Finance", *Journal of Political Economy* (April 1978), Part 2.

Table 2
Inflation's Effect via the Tax System

Component of tax system	Percentage change in equity value due to a 4 percentage point rise in the expected inflation rate*	Percentage change in equity value due to an unexpected once-and-for-all rise in the price level of 4 percent
Tax on inventory profits	— 5.4	—0.6
Tax on understated depreciation allowances	—10.9	—0.9
Effect on nominal debt and debt servicing	4.8†	1.1
Capital gains tax (in personal income tax code)	— 5.3	0
Total	—16.8	—0.4

* Upper limits of the impacts.

† Assumes that real rate of interest earned by bondholders remains constant, the corporation reaping the entire gain from the tax treatment of interest payments. (Refer to discussion in the text.)

Source: Marcelle Arak, "Can the Performance of the Stock Market Be Explained by Inflation Coupled with Our Tax System?", Federal Reserve Bank of New York Research Paper Number 7820.

about 50 percent larger than mine. In a different approach, FGS compared two situations with different rates of inflation. According to their model, a 6 percent inflation differential leads to a 21 percent differential in the rate of return on equity, a bit less than my calculations indicate. All in all, the different methodologies indicate that the tax system could be an important factor in the performance of the stock market but it cannot explain the entire decline in real stock prices.

Criticism of the corporate taxation argument

Although taxes appear to be a plausible explanation of at least part of the stock price decline, several researchers have argued that the historical data are inconsistent with this explanation.

One piece of evidence cited is the ratio of taxes to before-tax cash flow (see glossary). This tax ratio *declined* from the fifties to the sixties to the seventies, whereas the tax structure hypothesis suggests an increase in the ratio of taxes to capital income.[8]

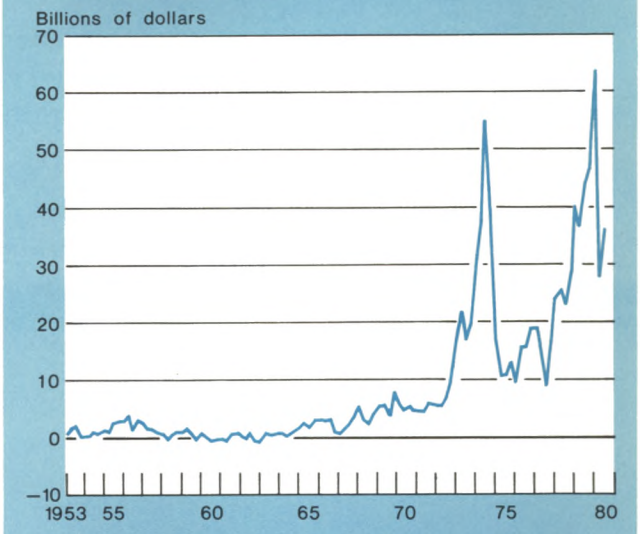
Although the movement of the ratio of taxes to cash flow is suggestive, it is not necessarily an accurate measure of the tax burden on *stockholders*. First, it uses all capital income rather than income earned by stockholders. If a larger fraction of funds is raised through debt, the relative tax burden will fall because interest is deductible in computing taxable corporate income. Second, the ratio of taxes to corporate income reflects *current* taxes. But a change in the expected inflation rate will affect anticipated *future* taxes and their ratio to cash flow. The ratio of current taxes to current cash flow could be affected very little.

Another piece of evidence cited is the rate of return on total capital (see glossary). This rate of return shows no trend in the postwar period as a whole, although it was somewhat lower in the midseventies than in the midsixties, when it was particularly high.

In this case also, it is not accurate to interpret the total return to capital as a measure of the return to stockholders. From the sixties to the seventies, there was a shift toward debt finance which has a more advantageous tax treatment. Because interest payments create a tax deduction for the corporation while dividend payments do not, the increased use of debt will raise total capital income, other things being constant. (Of course, it also raises leverage and riskiness.) For example, a corporation which raised the proportion of capital financed with debt by 10 percentage points could raise its *total* return on capital by about ½ percentage point.[9]

Chart 4

Inventory Profits



Source: United States Department of Commerce, Bureau of Economic Analysis.

Let us look more closely at the income of stockholders and their return on capital. To obtain the income of stockholders, reported aftertax corporate profits (see glossary) must be adjusted to eliminate inventory profits and to reflect depreciation on a replacement-cost basis; both of these adjustments reduce aftertax profits. Then, to this adjusted profits (see glossary) figure must be added the gain to stockholders from the reduction of the real value of their net financial liabilities. Inflation lowers stockholders' real debt to bondholders, banks, etc., so that the corporation could issue more nominal debt without raising the future real burden of its debt; the funds from the new bond issues could be used to increase stockholder dividends without reducing the corporation's

[8] According to Fama (1979), the decline in the tax ratio resulted from improved depreciation allowances—shorter service lives and accelerated depreciation—and the deductibility of interest payments. In the seventies, the larger investment tax credit was important.

[9] Let K be the capital stock, D the corporation's debt, r the interest rate, and G gross earnings after labor and depreciation costs. Total capital income is aftertax corporate profits $(I - t)(G - rD)$ plus interest payments rD. If the fraction "b" of capital is financed by debt, income per dollar of capital is

$$\frac{(I - t)(G - rbK) + rbK}{K} \text{ or } (I - t)\frac{G}{K} + trb.$$

A change in "b" alters the return by $tr(\Delta b)$. If "t" is 0.46 and r is 0.12, then Δb of 0.1 produces a change in the rate of return of 0.55 percent.

Table 3
Views on Inflation and Stock Values

Author	Major reason why inflation harms stock value	Is the corporate tax structure relevant?	Are other tax elements important?
Arak	Taxation of equity a partial explanation	Yes	Yes, capital gains
Fama	No true connection	No	No
Hendershott	Favored tax treatment of housing	No (Equity values should be helped by inflation)	Yes, treatment of housing
Kopcke	Taxation of equity explains a large portion	Yes	Yes, capital gains
Modigliani-Cohn	Use of a nominal interest rate to discount profit streams, plus error in calculating profits	No	No

Sources: See text.

ability to maintain the same level of future real dividends. Thus, according to standard economic definitions of "income", such gains on outstanding liabilities should be included in income.

Reported profits and true profits have been very different in recent years (Chart 5). The divergence between the measures in the fifties and early sixties reflected primarily the relatively long service lives specified by the IRS. These kept depreciation allowances below true depreciation. As service lives were liberalized, this situation changed. When inflation accelerated in 1973, however, it became the predominant influence on the relationship between profit measures. True profits began to fall very far short of the standard profits. For example, in the fourth quarter of 1979, true profits were running at a $90 billion annual rate, 23 percent below reported profits.

The adjusted profits measure—used by many analysts—fell even more relative to standard profits. But it is apparent that this measure substantially overstates the effect of inflation on stockholder income. The adjusted profits measure involves subtractions from reported corporate profits for inventory profits and true depreciation but does not add in the gain to stockholders from their reduced bond obligations.

The true profits figures can be used to calculate the tax rate of, and rate of return to, stockholders. The tax burden on stockholders (as measured by taxes relative to before-tax true profits) declined from the fifties to the sixties (Chart 6). Since the 1960s, however, the tax burden on profits increased, in contrast to the tax burden on total capital income cited above.

The rate of return to capital owned by stockholders —the stockholder analogue to the rate of return to total capital—was computed using true profits in the numerator. The denominator was the replacement cost of capital minus the market value of (net) financial debt, as calculated by George Von Furstenberg.[10] The decline in the stockholder returns from the high levels of the sixties to the seventies was enormous (Chart 7), whereas the total capital return did not decline much.

The data therefore support the view that the tax burden on stockholders increased since the sixties. The data also suggest that there was a very substantial decline in the aftertax return to equity capital, a decline only partly attributable to the higher effective tax rate.

Alternative explanations of the fall in real stock prices

Economists have put forth several alternative explanations of the decline in real stock prices (Table 3). One cogent argument begins with the observation that our

[10] George Von Furstenberg, "Corporate Investment: Does Market Valuation Matter in the Aggregate?", *Brookings Papers on Economic Activity* (1972:2).

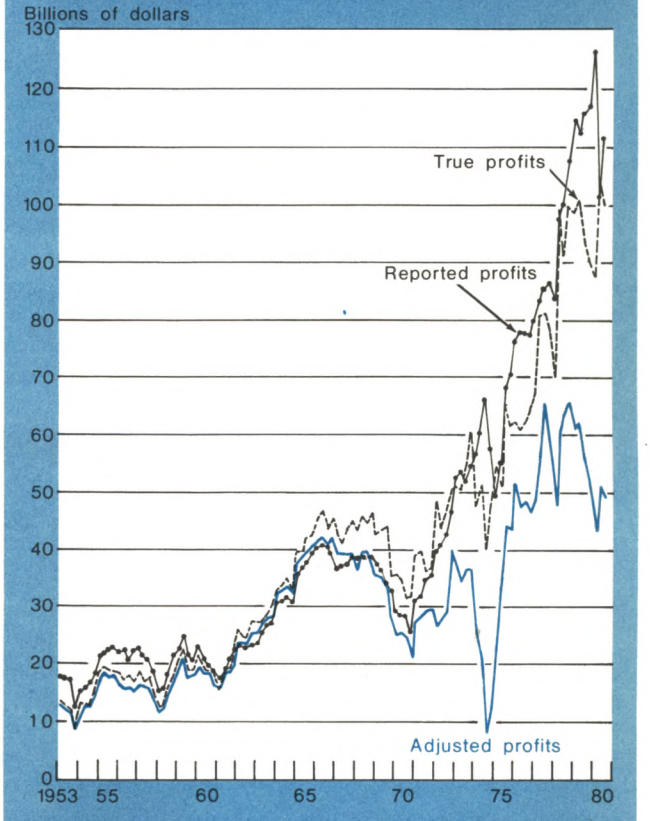
tax system treats owner-occupied dwellings in a special way. In an inflationary environment, homeowners expect the value of their houses to appreciate; at the same time, interest rates will be high, reflecting the expectation of price rise. Homeowners can deduct their interest payments in figuring their taxable income. However, the services rendered by owner-occupied dwellings, that is, the implicit rental value, is not taxed, and the capital gains are taxed only when a home is sold and then only in some circumstances.[11] In effect, if an owner lives in his own house, the "dividends"—the current rental services—are not taxed as they would be if provided by a third party. Also, the capital gains on owner-occupied housing are effectively taxed less heavily than capital gains on other assets because home-sale capital gains taxes often can be postponed by reinvestment or completely avoided by selling after age 55. When inflation accelerates, both interest costs and expected capital gains increase and the asymmetry in tax treatment becomes more valuable. This asymmetry in the tax treatment of owner-occupied housing has caused the user cost of housing to decline substantially. For example, if a person is in a 45 percent tax bracket, the decline has been about 4 percentage points according to Hendershott (1979).[12]

What effect would the reduction of the cost of housing have on stock prices? Lower housing costs will influence people to buy rather than rent and to buy larger and/or higher quality houses. The shift of funds toward housing and away from other investments would tend to push down equity prices. Profits relative to stock prices would then be higher, comparable to the attractive yield on homeownership. This argument is both logical and consistent with most of the facts including the rapid increases in the prices of homes. The one fact that does not quite fit is that bond yields have increased about as much as the rate of inflation, so that the real return on bonds has not risen along with the return on houses and corporate equity.

A different argument is that inflation causes people to make mistakes in evaluating investment opportunities. Modigliani and Cohn, for example, hypothesize that investors use a nominal interest rate in calculations which should be done with a real interest rate. During an inflationary period when the nominal rate is substantially higher than the real rate, this error means that they are discounting future earnings too heavily and therefore undervaluating equity ownership. Suppose, for example, that current dividends per share of a particular corporation are $2, the real return on risky investments is 7 percent, and the expected inflation rate is 8 percent. The nominal return to risky investments is therefore 15 percent (=7+8). With an inflation rate of 8 percent, dividends will probably be 2(1.08) next year, $2(1.08)^2$ the following year, etc. The value of a share of stock is the present discounted value of that flow of dividends. Discounting this stream of nominal earnings by the nominal rate of interest,

Chart 5

Alternative Measures of Aftertax Corporate Profits of Nonfinancial Corporations



Source: Reported and adjusted profits: United States Department of Commerce, Bureau of Economic Analysis. True profits: calculated by the author as described in the text.

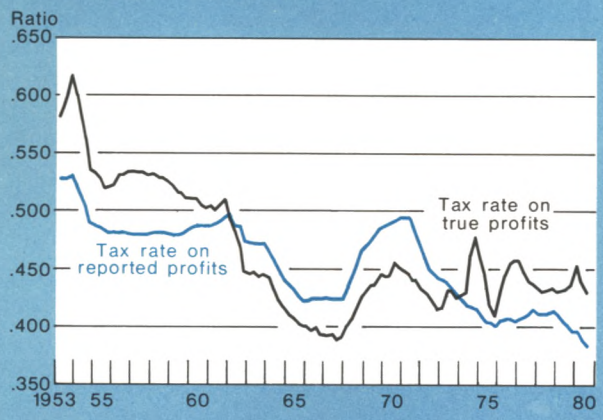
[11] For those under age 55, gains from sale of a principal residence which are reinvested in a new principal residence are not taxed at the time of receipt. For those over 55, $100,000 of the capital gain may be excluded from taxation, subject to certain conditions.

[12] Patric H. Hendershott, "The Decline in Aggregate Share Values: Inflation, Taxation, Risk and Profitability", Conference on the Taxation of Capital (November 16-18, 1979).

Chart 6

Taxation of Alternative Measures of Corporate Profits of Nonfinancial Corporations

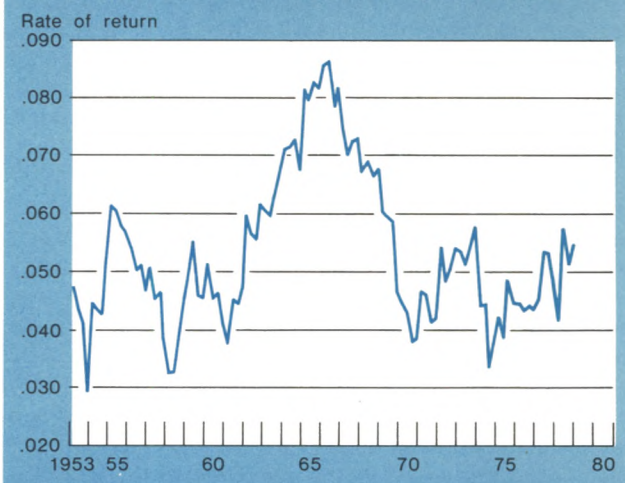
Four-quarter moving average



Source: Tax payments and reported profits: United States Department of Commerce, Bureau of Economic Analysis. True profits: calculated by the author as described in the text.

Chart 7

Aftertax Profitability of Corporate Capital



Numerator is true profits; denominator is capital valued at replacement cost less the market value of net financial debt. See text for a description of the calculations and the data sources.

the value of the share of stock is:

(a) $2 + 2(1.08)/1.15 + 2(1.08)^2/(1.15)^2 + . . + .$,
or roughly
(b) $2 + 2/1.07 + 2/(1.07)^2 + \ldots +$

which amounts to about $30. Note that, according to (b), the current dividend should be discounted at the *real rate of interest*, not the nominal rate of interest. (This is true for other returns and inflation rates as well.) If the current dividends were discounted by the nominal return of 15 percent, the stock would be mistakenly valued at only $13!

In addition, Modigliani and Cohn hypothesize that investors make a second mistake: they fail to include the reduction of the real value of outstanding debt caused by price increases as part of profits.

They test these hypotheses by analyzing the factors that influenced share prices in the past. Specifically, the authors estimate an equation for share prices which includes among other items (a) the nominal rate of interest and (b) a weighted average of past inflation rates that was assumed to represent expected inflation. Since the real rate of interest can be represented as a nominal interest rate *less* the expected rate of inflation, (b) ought to get a coefficient of opposite sign to (a). As it turns out, however, both the interest rate and the inflation rate variable get negative coefficients! The negative coefficient on the price variable is not significantly different from zero in a statistical sense. However, even zero is much too low a coefficient.[13]

The authors interpret this result as evidence that investors are making two valuation errors—misusing a nominal rate as a real rate and failing to include the fall in the real value of outstanding debt as part of equity earnings.

How strong is their argument? Hendershott pointed out that it is difficult to reconcile such a misvaluation with the fact that the nominal bond rates have risen about one for one with the increase in inflation. By his model, investor shifts from stocks into bonds cause the real aftertax returns, adjusted for risk, to be equal. Therefore, if investors did not properly account for inflation, bond returns would have stayed low, in tandem with real returns on stocks.

[13] Expected inflation should have an equal and opposite sign from the nominal rate of interest—to convert the nominal rate to a real rate—plus a coefficient reflecting the anticipated future inflation-produced capital gains on the outstanding debt.

Moreover, there are other ways to explain the empirical results obtained by Modigliani and Cohn. For example, a weighted average of past inflation rates could be a poor estimate of the inflation rate expected to prevail over the long term. On the other hand, because nominal bond rates incorporate price expectations, changes in bond rates could be a good proxy for changes in expected inflation. Indeed, if variations in the real rate of interest tend to be small, then most of the changes in the bond yield will reflect changes in price expectations. In this case, the bond rate would be proxying for expected inflation and its coefficient would represent the effect of expected inflation on equity values rather than the effect of real interest rates on equity values. By this interpretation, the coefficient of −0.059 obtained in one of their regressions indicates that each 1 percentage point increase in the expected rate of inflation would reduce stock values by 5.9 percent; a 6 percentage point increase in the rate of inflation would therefore reduce real stock prices by about 35 percent. Interestingly enough, this is within the range of the Arak-Kopcke stock price impact calculated from the tax structure.

While many explanations of stock price behavior are related to inflation in some way, others are not. For example, some economists argue that equity prices have declined for the simple reason that corporate profitability before taxes has dropped sharply. Charts 6 and 7 lend support to this view; they show that stockholders' (aftertax) return dropped substantially while the tax rate on stockholders increased only moderately. Another factor may be that the growth prospects during the 1960s were much brighter than during the 1970s. Since stock values are based upon expected dividend growth, the outlook could well be an important element.

Conclusions and implications

There is no single factor that can plausibly explain the substantial fall in real stock values over the past ten to fifteen years. However, the tax system—the corporate and capital gains tax as well as the tax treatment of housing—probably has played a significant role.

Besides lowering real stock values, the current tax system may impair productivity by lowering desired capital investment and encouraging shorter lived capital than is optimal from an economy-wide vantage point. Moreover, the tax system gives firms a large incentive to leverage themselves. Taken together, there would be important gains from reforming the corporate tax system to get rid of the features which cause nonneutrality with respect to inflation.

Of the features considered above, the depreciation-allowance rules are the single most important in terms of the impact on real stock values. Moreover, the depreciation allowances probably were important in inducing business to build less durable capital than is desirable from society's viewpoint.[14] The ideal solution is to base allowances on replacement cost, rather than on original cost, while using write-off schemes that approximate the true depreciation of each piece of capital. *Ad hoc* schemes to improve depreciation allowances, such as shortening the permissible service lives or widening the scope for use of accelerated depreciation, work imperfectly. Only at one particular inflation rate and with one particular technological mix will they exactly offset the shortfall in the true depreciation generated by the use of original cost. If the inflation rate were to fall, such schemes would lead to higher profits and longer lived equipment than is economically efficient. According to the Bureau of Economic Analysis, Department of Commerce, the understatement of depreciation was about $17 billion in 1979. If this were added to the depreciation write-offs currently allowed, it would have cost the United States Treasury less than $8 billion in 1979, far less than some of the other schemes that have been proposed to improve depreciation write-offs.

Another issue is whether the United States wants to retain tax provisions that allow the full deduction of nominal interest payments by both business and homeowners, and the full taxability of interest receipts. For the corporation, the deduction of nominal interest payments about offsets the taxability of nominal inventory profits. However, for the homeowner there is no similar offset; the homeowner clearly benefits. Although this country wants to encourage homeownership, inflation undoubtedly has widened the encouragement far beyond the original plan. Some tax change that would alter this situation without greatly hurting current homeowners would be desirable.

[14] Patrick Corcoran, "Inflation, Taxes, and the Composition of Business Investment", this *Quarterly Review* (Autumn 1979), pages 13-24.

Marcelle Arak

Cutting the Federal Budget

Analyzing How Fast Expenditure Growth Can Be Reduced

Federal outlays in fiscal year 1981 threaten to exceed $660 billion, well above the second budget resolution ceiling of $632.4 billion and the goal of $635 billion contained in the Stockman-Kemp memorandum to the then President-elect Reagan on "Avoiding a GOP Economic Dunkirk".[1] Federal spending as a percentage of gross national product (GNP) could exceed the postwar high of 23.1 percent, and the unified budget deficit could be $60 billion or greater. When combined with an off-budget deficit of about $23 billion, this would result in new Treasury marketable financing of over $80 billion. At this point, it is highly unlikely that projected unified budget outlays for 1981 can be reduced. Various changes, some of which are cosmetic[2] and do not affect the size of Government, may be proposed. However, a major push during the next few months to cut spending for 1981 could very well end up a wasted effort and at the same time use up "political capital" necessary for meaningful cuts in 1982 and 1983. The outlook for Federal outlays in 1982 and 1983 under current policies is for continued high rates of spending. With the start of fiscal year 1982 only eight months away, a legislative calendar devoted primarily to the control of Federal spending could reduce projected outlays for fiscal year 1982 by about $10-15 billion. A significantly larger reduction would take an extraordinary effort on the part of the new administration and a degree of cooperation by the Congress that is rarely seen. Realistically, however, the earliest target date for a full offset (through spending cuts) to the $30-35 billion per year revenue loss from a 1981 individual income tax cut probably would be fiscal year 1983.

James R. Capra, Senior Economist in charge of the Fiscal Analysis Staff, Monetary Research Department, is the author of this article. He was formerly the Chief of Budget Projections for the Congressional Budget Office. The views expressed are those of the author and do not necessarily reflect those of the Federal Reserve Bank of New York or the Congressional Budget Office.

[1] This memorandum was written by David Stockman and Jack Kemp in late November 1980. More recent policy statements indicate that the administration may ultimately set a target of $645-650 billion for 1981 Federal outlays.

[2] Among the cosmetic changes are asset sales from the Farmers Home Administration to the Federal Financing Bank (FFB)—an off-budget agency—and changes in the timing of offshore oil sales.

The 1981 problem

There appears to be a consensus that Federal spending programs ought to be cut, or at least the rate of growth reduced. However, there is a misconception that this can be done rapidly—in 1981, for example. The two largest components of spending are national defense and benefit payments for individuals (Table 1). Defense clearly will not be reduced in the near future; rather there appears to be widespread support for increases. Almost all benefit payments programs are entitlements, which means that eligible beneficiaries have a legal claim on the Federal Government. Changes require substantive legislation that would take months to formulate, negotiate, and implement. For example, the recently enacted budget reconciliation bill—an omnibus bill that changed current law for many programs—was formulated in the spring of 1980, negotiated in part in the first budget resolution conference in the early summer and in part by conferences on various components of the bill during the remainder

of the summer and in the fall. Some of the new provisions of current law that are the result of this bill will take months to implement, making the total time from proposal to implementation almost a year.[3]

Table 1

Estimated Federal Outlays for Fiscal Year 1981

In billions of dollars

Spending category	Amount
National defense*	146.7
Benefit payments to individuals	331.4
Other grants to state and local governments†	58.3
Net interest	67.4
Other Federal operations	56.2
Total	660.0

* Includes Department of Defense military and defense-related activities of the Department of Energy but not military retired pay which is included under benefit payments.

† Includes those grants that are *not* for benefit payments.

Table 2

Possible Proposals for 1981 Outlay Cuts and Savings that Might be Claimed

In billions of dollars

Proposal	Amount	Type of cut
Small Business Administration disaster loans	1.2	(One time)
Medicare and medicaid	1.0	(Permanent)*
Strategic petroleum reserve	0.8	(Cosmetic)†
Solvent refined coal demonstration plants I and II	0.2	(Permanent)
Public service employment	0.4	(Permanent)
Unemployment insurance	0.8	(Permanent)
Trade adjustment assistance	0.7	(Permanent)
Economic support fund	0.4	(Delay)
Postpone July 1 social security increase	4.5	(One time)
Asset sales	1.5	(Cosmetic)
Outer continental shelf leases	1.8	(Cosmetic)
Travel, pay, and consulting	1.7	(Cosmetic)
Total	15.0	

* For the permanent items the savings to 1982 and 1983 outlays would be different from the 1981 savings.

† This reduction is listed as cosmetic since the change probably would not reduce the long-run costs to the Federal Government and may ultimately result in an increase.

After defense and benefit programs, two smaller categories—grants and other Federal operations—remain for consideration. For grants, outlays during the remainder of fiscal year 1981 largely represent payments for obligations that have already been incurred or contracts already signed. Major programs in this category include aid for elementary and secondary education, grants for the construction of wastewater treatment plants, and the Federal-aid highways program. For the education programs, obligations for the 1981 school year were made in the summer of 1980. For the construction programs, 1981 outlays primarily represent the execution of contracts signed in 1980 and prior years. Breaking these contracts would be very difficult and very expensive. The final category—other Federal operations—is comprised of many different Federal programs, ranging from the strategic petroleum reserve to farm price supports and pay for the nondefense Federal work force. For the major programs, the problems with reducing 1981 outlays are similar to those for national defense, benefit payments, and grants. The strategic petroleum reserve is a high priority item. The new administration and a clear Congressional majority favor increases rather than a scaling-down of the program. The farm price supports program is an entitlement and changes probably will not be forthcoming until a new farm bill is considered this spring. Even major changes in the bill will probably not significantly affect 1981 outlays. Federal pay, on the other hand, could be reduced by attrition or even by layoffs. However, even a 10 percent reduction of Federal civilian agency employment would save less than $1 billion in fiscal year 1981.

The bleak prospects for changes that would reduce 1981 outlays need to be emphasized. If the primary focus of the upcoming debate over control of spending becomes fiscal year 1981, the prospects for meaningful reductions in 1982 and 1983 may be jeopardized, with near-term savings being achieved through delays or even exchanged for subsequent program expansions. The recently enacted reconciliation bill provides a good example of the potential problems, with overemphasis on near-term savings. In the House-passed bill, 1981 savings in medicare and medicaid were exchanged for program expansions in 1982-85. Another example is child nutrition where an immediate one-time cut was finally agreed to in exchange for no reductions in 1982-85. Some reductions of 1981 outlays

[3] Another example of problems with making cuts in benefit payments quickly is the food stamp program. In each of the past two years reforms have been enacted, but it now appears that in both cases the changes will take more than one-year longer to implement than anticipated at the time of passage.

are, of course, not impossible, but large cuts are highly unlikely.

Nevertheless, the new administration is likely to propose budget cuts for 1981. The following list represents some of the major components that have been discussed recently, together with the savings in the fiscal year ending September 1981 which might be claimed for them. The savings listed are highly dependent on early enactment.

- Change the newly enacted Small Business Administration (SBA) authorization to make farmers who were victims of the 1980 spring-summer drought ineligible for SBA disaster loans. This change could be assumed to result in a one-time saving of $1.2 billion in 1981. (The new authorization made victims of future droughts ineligible for SBA loans.)
- Make miscellaneous changes in the laws governing medicare and medicaid, including caps on certain fees for services. By assuming almost immediate enactment, about $1 billion in permanent savings could be claimed.
- Fund the strategic petroleum reserve by having the Federal Government sell shares in the stored oil or by issuing bonds to defray the cost of oil purchases. If early enactment of this complex proposal were assumed, an increase of $0.8 billion in offsetting receipts and a decrease in net Federal outlays would be claimed. The future-year effects are unclear, depending on whether the oil reserve is used and on the assumed rate of return to shareholders or bondholders. In all likelihood, the proposal would increase the long-term costs to the Federal Government.
- Delay, or possibly terminate, construction of the two solvent refined coal demonstration plants (SRC I and II) at a savings of $0.2 billion.
- Terminate all funding for countercyclical public service employment, including a rescission of funds already appropriated. Savings of $0.4-0.6 billion in fiscal year 1981 might be claimed, although action would have to take place quickly. A significant portion of 1981 funds have already been obligated. As discussed later, this cut would have a larger effect on projected outlays for 1982 and 1983.
- Make miscellaneous changes in the unemployment insurance laws, which if enacted quickly would save $0.8 billion. Trade adjustment assistance changes, saving about $0.7 billion, also might be proposed.
- Change the method of disbursement of credits to Israel through the Economic Support Fund back to the pre-1979 approach. By assuming early enactment of this change, the new administration could claim the delay of $0.4 billion in outlays until 1982.
- Postpone the July 1, 1981 social security increase until October 1, 1981. This proposal, which would affect recipients of social security, railroad retirement, supplemental security income, and veterans' pensions, would be for a one-time postponement. Savings of $4.5 billion in 1981 could be claimed, but there would be no lasting effect on Government spending levels.[4]
- Increase asset sales of Federally held mortgages and insurance by the Farmers Home Administration to the FFB. These sales would shift about $1-2 billion in outlays off-budget. The change would be cosmetic since the FFB purchase would then become part of the off-budget deficit and would still be financed through the issuance of Treasury debt.
- Move a scheduled sale of outer continental shelf leases from September to August 1981 so that all the receipts would offset outlays in 1981 rather than in 1982. This could reduce the 1981 budget totals by $1.5-2.0 billion but would increase the 1982 totals unless the 1982 schedule is revised.
- Finally, the new administration may propose miscellaneous rescissions of already enacted appropriations for travel, pay, and consulting services of about $1-2 billion. The size of the cut may be somewhat dependent on how much is needed to reach the announced goal for total outlay reductions. Outlay savings in 1981 would be difficult to achieve because, even if the Congress enacted a rescission of budget authority, agencies would probably absorb the cut in slow spending programs rather than in travel and pay where outlays flow quickly from budget authority. Thus, the reduction would be to 1982 outlays.

These possible proposals which total as much as $15 billion are summarized in Table 2.

Each of the proposals for 1981 reductions would require a major effort on the part of the new administration. Even proposed delays and one-time reductions could encounter stiff resistance that might either ulti-

[4] In theory, this proposal would lead to savings of about $400-600 million in interest on the public debt in 1982 and later years if the temporary reduction of 1981 outlays were not used to fund a larger tax cut or a larger defense program.

mately defeat the proposed changes or at least could stall enactment until the savings would be significantly reduced. In the long run, the Congress and the President can control virtually every dollar spent by the Federal Government by making changes in the numerous laws governing Federal expenditures. However, forging a consensus on just which laws ought to be changed—and how they ought to be changed—takes time. Also, after that consensus is reached and laws are changed, implementation is anything but immediate.

Only eight months will remain in fiscal year 1981 after the new administration takes office and probably only four months will remain by the time a third budget resolution for 1981 is passed by the Congress. The most realistic (and possibly the best) strategy may be to forget about large budget cuts for fiscal year 1981 and to work out proposals carefully that will affect 1982 and more importantly 1983. Unfortunately, it is already getting late to do as much as might be desired about 1982. As will be shown later, more than a 2 percent reduction of projected outlays for 1982 as a result of Congressional action over the next eight months is hard to visualize. A reduction of even that size will not be possible if the 97th Congress and the administration spend the next several months on quick-fix options designed to reduce the 1981 budget totals.

Spending reductions for 1982 and 1983

At present, with no new program initiatives (except for defense), Federal outlays for 1982 and 1983 may be projected at $760 billion and $850 billion, respectively. The projection assumes 5 percent real growth of defense, 2 percent real growth of benefit payments, primarily due to demographic and case-load changes, and no real growth of grants and other Federal operations. The estimates in Table 3 provide a useful baseline from which spending cuts can be considered.

In evaluating potential budget reductions, the following factors are important. All cuts require joint action by the administration and the Congress. With the passage of the Congressional Budget Act, the President can no longer impound funds. The proposals that follow have been restricted to those that are considered to be politically and technically feasible in the sense that they have a reasonable chance of being proposed, adopted, and implemented in time to achieve the savings listed for 1982 and 1983. Finally, although outlay savings proposals for national defense exist, they are not likely to result in a smaller spending total. The entire national defense discussion is now being framed in terms of real growth, with 5 percent real growth being the minimum figure under active consideration. Cuts in low priority or unnecessary defense expenditures are likely to be offset by increases in order to sustain the real growth target that emerges from the debate over the next few months.

The remainder of this article will review in some detail the ways in which projected Federal spending for fiscal years 1982 and 1983 could be cut. The reductions of benefit payments, grants, and other Federal operations that will be discussed and are summarized in Table 4 cut across many different Federal programs and represent an ambitious agenda for the first session of the 97th Congress that would require numerous changes in current law. The options do not include all possible budget-cutting alternatives that have been or will be proposed, but in general they are the ones that have been most prominently discussed during the past year. Some have been included in President Carter's budget proposal. Additional budget-reduction alternatives may be put forward, and some that are not considered in this article could ultimately be enacted. However, since each change requires separate consideration and negotiation, it is doubtful that a program significantly larger than the one outlined in this article could be formulated, negotiated, and implemented within the next eight months.[5]

Benefit payments for individuals

The largest benefit payments program is social security with projected outlays in fiscal year 1982 of over $160 billion. The upcoming July 1981 benefit-level increase, estimated at over 12 percent, will raise the annualized cost of social security by over $17 billion. Proposals to make major changes in social security indexing stand little chance of being enacted and probably will not even be proposed since they affect over 35 million recipients, most of whom are eligible voters. As a general rule, to stand any significant chance of passage, proposed cuts in social security should be designed to affect either subsets of existing recipients or future recipients.[6] For example, the following cuts could be proposed (Table 5).

- Under current law, dependent benefits are paid to unmarried students between the ages of 18 and 21. This benefit, which is not based upon need and costs about $2 billion annually, could

[5] A longer list of budget-reduction options can be found in *Reducing the Federal Budget: Strategies and Examples* (Congressional Budget Office, February 1980). The Congressional Budget Office plans to update this report in March 1981.

[6] This assumption may turn out to be wrong. However, the chances of large near-term social security reductions that affect all current beneficiaries appear to be so remote that it would be unproductive to formulate a budget policy that depends to a significant degree on their enactment.

Table 3

Projected Outlays Assuming 5 Percent Real Growth for Defense and No New Nondefense Initiatives*

By fiscal year; in billions of dollars

Spending category	1982	1983
National defense	172	203
Benefit payments	375	418
Other grants	64	69
Net interest	86	93
Other Federal operations	63	67
Total	760	850

* Also assumed is $16 billion in off-budget spending for 1982 and 1983.

Table 5

Social Security Savings

By fiscal year; in millions of dollars

Item	1982	1983
Phase out student benefits	200	800
Eliminate minimum benefit	65	135
Eliminate lump sum death benefit	165	190
Phase out survivor benefits for high school children, age 16, 17, and 18	300	2,000
Total	730	3,125

Table 4

Reductions of Federal Spending for Fiscal Year 1982 and the Effects on 1983

By fiscal year

Spending category	1982 Billions of dollars	1982 Percent*	1983 Billions of dollars	1983 Percent
Benefit payments	— 5.9	1.6	— 8.5	2.0
Other grants	— 3.0	4.6	— 4.4	6.3
Other Federal operations	— 2.9	4.6	— 6.5	9.7
Total	—11.8	1.6	—19.4	2.3

* For each spending category, the percentage represents the cut as a fraction of projected spending for the category. For the total, the percentage represents the sum of the reductions expressed as a fraction of projected total Federal outlays.

Table 6

Unemployment Compensation Savings

By fiscal year; in millions of dollars

Item	1982	1983
Eliminate the national trigger for extended benefits	1,000	1,000
Reduce trade adjustment assistance benefits	1,400	300
Total	2,400	1,300

Table 7

Income Support Savings

By fiscal year; in millions of dollars

Item	1982	1983
Monthly income reporting	400	500
Child nutrition	200	200
Food stamps	700	1,000
Total	1,300	1,700

be phased out starting in 1982 by stipulating that payments would not be made to students who reach their eighteenth birthday after October 1, 1981.

- A minimum social security benefit of $122 is currently provided to insured workers who retire at age 65, regardless of the level of their past earnings. Many of those who receive the benefit have earned pensions under other programs, typically civil service retirement. Elimination of this benefit and coverage of those actually in need through supplemental security income (SSI) would save about $100 million per year.
- All surviving families receive a lump sum death benefit of $255. The benefit is out of date, not having increased significantly since 1954. Coverage of those families in need could be provided through SSI.
- Currently, families with children under 18 are entitled to survivor benefits for each child and for the spouse under the assumption that the parent cannot work away from home while a child is in his or her care. A phasing-out of benefits for high school children age 16, 17, and 18—where the rationale for the benefit is probably not applicable—would save up to $2 billion by 1983.

In the area of health, there are numerous proposals to restrict the growth of medicare and medicaid. Projected costs in 1982 for hospital insurance, supplementary medical insurance, and medicaid total more than $67 billion. Like social security, however, medicare and medicaid benefits are paid to millions of recipients (more than 45 million). Proposals with a reasonable chance of enactment would save about $1 billion in 1982 and $1.8 billion in 1983. Mandatory hospital cost containment might save more. However, the new administration and the Congress may wait another year or two to evaluate whether hospitals have voluntarily moderated their price increases. The earliest consideration of a new cost containment proposal probably will be in connection with the 1983 budget.

Unemployment compensation, with an estimated fiscal year 1982 cost of over $20 billion, is another area where reductions might be feasible. One of the largest cuts would be achieved by eliminating the national trigger for extended benefits (Table 6). Currently, an extra thirteen weeks of benefits are paid to all recipients when the national insured unemployment rate exceeds 4.5 percent even though a state's rate may be below 4.5 percent. This proposal was included in the Senate's version of the reconciliation bill but was removed in the House-Senate conference agreement on the bill. Other reductions of unemployment benefits could be achieved by implementing the Government Accounting Office recommendations that trade adjustment assistance benefits be paid only to those who have exhausted their unemployment insurance benefits and be payable at the same level as unemployment insurance benefits. The rationale for this reduction is that under current law it is possible for trade adjustment assistance recipients to receive benefits (when combined with other income transfer payments) which exceed their take home pay prior to becoming unemployed. Clearly, this is likely to create a disincentive for trade adjustment assistance recipients to start looking for work.

Miscellaneous income support or welfare programs such as aid to families with dependent children ($9 billion), food stamps ($12 billion), supplemental security income ($8 billion), and child nutrition ($4 billion) are potential targets for reductions (Table 7). A nationwide monthly income-reporting system, together with one-month retrospective accounting (that is, basing each month's benefits on the previous month's income), would eliminate some of the current welfare abuses. Other reductions include making permanent the change from a semiannual to an annual cost-of-living adjustment for child nutrition and certain miscellaneous food stamp cuts.

Finally, veterans programs are a potential target for reductions, although it has been extremely difficult to obtain passage of legislation that would cut the $20 billion of benefits and administrative expenses. The largest cut that has been discussed recently would require private insurance companies to reimburse the Veterans Administration for insured persons treated in veterans hospitals, so-called "third party reimbursement" (Table 8). The House and Senate Veterans Committees have been very reluctant, however, to report this legislation. Other changes for veterans, such as reducing burial benefits by the amount of the other Federal burial benefits received by veterans, would have a smaller effect on outlays.

Grants to state and local governments

Over the last thirty years the largest growth of Federal spending, on a percentage basis, has occurred in grants to state and local governments for other than benefit payments. The following are some possible cuts (Table 9).

- Federal spending on highways is growing very rapidly. It is not clear that this growth is desirable in light of the need to cut back on energy consumption. Reimposition of a tight obligation

Table 8

Veterans Savings

By fiscal year; in millions of dollars

Item	1982	1983
Third party reimbursement	350	400
Veterans' compensation, pensions, and burial benefits	100	100
GI bill changes	60	80
Total	510	580

Table 9

Cuts in Grants to State and Local Governments

By fiscal year; in millions of dollars

Grants	1982	1983
Highways	700	1,500
Environmental Protection Agency low priority construction	50	350
Public service jobs	1,000	1,100
Other Comprehensive Employment and Training Act programs	700	750
Impact aid for school districts	250	350
Discretionary health programs	300	300
Total	3,000	4,350

Table 10

Cuts in Other Federal Operations

By fiscal year; in millions of dollars

Item	1982	1983
Strategic petroleum reserve oil purchases	1,000	3,000
Termination of solvent refined coal demonstration plants I and II construction	500	1,000
Commodity Credit Corporation price support reductions	100	1,000
Railroad cuts in low priority routes	300	350
Federal payment to postal service	250	250
Wage board pay raises (nondefense)	60	60
Reduction of outmoded soil and water conservation projects	100	100
Reduction of civilian agency employment	440	480
Limit nondefense travel and transportation	100	200
Total	2,850	6,440

ceiling on the Federal-aid highways program could hold 1982 and 1983 outlays to about $8 billion per year.

- The Environmental Protection Agency (EPA) makes grants for the construction of wastewater treatment plants. Because of various requirements specified in the law that emphasize "ready to go" rather than high priority projects, approximately 25 percent of the funds have been used for low priority projects. Unfortunately, the savings from a change to eliminate these projects build slowly. Nevertheless, the 1985 savings would be about $1 billion, out of a projected cost of $4 billion.
- Expenditures for countercyclical public service jobs will total about $1 billion in 1981. This program has demonstrated a marked procyclical pattern. It probably should (and in all likelihood will) be terminated in 1982.
- Many other Comprehensive Employment and Training Act (CETA) programs do not appear to be effective or duplicate private-sector programs. A 10 percent cut in the $7 billion in projected outlays probably could be achieved without impairing the effectiveness of the programs. The cuts could be across the board or targeted toward specific programs like summer youth or the public service jobs program for the structurally unemployed (Title II of CETA).
- The impact aid program compensates school districts for children whose parents live or work on Federal property. Annual funding is about $800 million. The purpose is to compensate school districts partially for educating pupils where the local tax base is reduced because of Federal property ownership or where enrollments are raised because of a Federal employer. Parts of this program clearly do not meet the intended needs. Past administrations have unsuccessfully proposed cuts, but last year the Congress came closer to approving reductions.
- During the past year, several proposals were made to reduce discretionary health grants which overlap with other programs. These include drug and alcohol abuse, mental health, family planning, and health planning. A proposal submitted in 1980 by Republican members of the House and Senate would save about $300 million (or slightly over 10 percent of the $2.5-3 billion spent on these programs).

The reductions to state and local government grants

summarized in Table 9 are for categorical grant programs, that is, grants where the Federal Government specifies the precise purpose or use of the funding. There appears to be little, if any, support in the Congress or in the new administration for cuts in community development block grants or in general revenue sharing.[7] In fact, most Republicans advocate the restoration of the $2.3 billion state share of general revenue sharing in 1982. One way to offset such an increase, however, might be to require states to forfeit funds for categorical grants on a dollar-for-dollar basis in exchange for revenue-sharing funds. This provision was written into the recently enacted general revenue-sharing reauthorization; however, a plan for implementing what could become a complex system of credits and debits does not yet exist.

Other Federal operations

This category contains numerous Federal programs. Some are not particularly effective, but few are large when compared with defense and the major benefit payments programs.

- Federal outlays for the purchase of oil for the strategic petroleum reserve are projected at about $3.5 for 1982 and $4.5 billion for 1983.[8] All these outlays would not necessarily be offset by the proposals for public capitalization or debt financing of the reserve discussed earlier. Various factors, ranging from the marketability of the certificates of ownership to the coupon rate (if any), would affect the size of the offset. The savings for 1982 would also be affected by the timing of a change in the law and lags associated with implementation. For the purposes of this analysis, savings (offsets) of $1 billion in 1982 and $3 billion in 1983 are assumed. The estimates reflect gradual implementation of a change enacted late in fiscal year 1981 or early 1982 and a program that includes an annual interest payment on the debt outstanding.[9]
- As discussed earlier, the termination of construction at the two solvent refined coal demonstration plants (SRC I and II) might be a potential budget reduction option since the current program has already shown the feasibility of the technology.
- Several changes could be made in the farm price support program administered by the Commodity Credit Corporation (CCC). The CCC spent about $3 billion in fiscal year 1980. Although several aspects of the various CCC programs could be changed so that outlays would be reduced, the Congress will be under considerable pressure for program expansions. The disaster payments program probably can be eliminated since it largely duplicates the newly enacted Federal crop insurance program. Also, cuts in dairy price supports, such as indexing support levels to annual rather than semiannual changes in prices, appear to be justified.
- Federal support of railroads totals $1.9 billion, including funds for construction and operating subsidies. Subsidies for low priority routes could be reduced, saving about $300 million per year.
- The $1.2 billion annual Federal payment to the Postal Service could be reduced. The cut need not specify elimination of Saturday mail delivery, as was proposed in March 1980. The Postal Service probably should be allowed to decide how to absorb the cut—either by raising rates or by new efficiency initiatives.
- The current procedure for computing pay raises for Federal blue-collar workers (wage board employees) overstates the percentage increase needed to maintain comparability with the private sector. The savings from reform would be over $500 million by 1983. However, three fourths of the $10 billion in pay is an expense of the Department of Defense. Most of the cut probably would be offset by other defense increases in order to maintain a 5 percent (or greater) real growth target for defense outlays.
- Miscellaneous soil and water conservation projects that have outlived their usefulness and actually are in direct opposition to wildlife conservation projects could be reduced. The budget for the Soil and Water Conservation Service is about $400 million.
- The Army Corps of Engineers currently spends about $1 billion per year for construction and operating costs on the nation's network of

[7] Over the next few months proposals may be made to cut Urban Development Action Grants, a program to help cities revitalize their economic bases and reclaim deteriorated neighborhoods. Reductions of appropriations, however, will not significantly affect outlays until after 1983.

[8] This projection assumes a fill rate in excess of 100,000 barrels per day and further increases of world oil prices.

[9] It should be noted that, in the long run, this proposal may cost more than current policies, depending on whether the oil purchases are debt financed or equity financed and on the relationship between oil price increases and interest rates.

inland waterways and to help maintain deep-draft ports. An increase in the per gallon fuel tax paid by inland waterway users could defray some of these expenses. (The receipts are treated as offsets to Federal outlays.) An increase of over 5 cents per gallon would be required for each $100 million in offsets. It is likely that such a proposal would encounter stiff opposition. The most recent increase in the tax was debated several years prior to enactment.

- A reduction of Federal civilian agency employment through attrition (for example, a two for one attrition-replacement policy) would reduce employment by 2 percent. Assuming a 1982 payroll of $24 billion, savings would be $400-500 million. However, it is not clear that such a policy is desirable, compared with more targeted cutbacks. The savings of $400-500 million could be achieved through attrition, major cutbacks in certain departments like the Department of Energy, or by a 10 percent cutback in the $5 billion spent by Federal agencies to formulate and enforce Federal regulations.
- Federal travel and transportation cost about $9 billion annually, with over 75 percent attributable to the Department of Defense. The $1.7 billion for civilian agencies is embedded within programs presented throughout the budget. Although data are maintained on travel and transportation expenses, budget and appropriations review is generally done on a programmatic basis rather than on an object class or input basis. Pending detailed review of travel and transportation policies, a general provision limiting 1982 expenses to 1981 levels could be attached to each nondefense appropriation bill, saving between $100-200 million. (It is not clear that such a policy is appropriate for the Department of Defense since most funds are used to transfer military personnel and move equipment.)

The reductions summarized in Table 10 do not include some across-the-board cuts that are expected to be proposed by the new administration. In particular, reductions of expenditures for consulting services may be proposed. However, unlike travel, little data is available on where or how money is spent or on how to make the reductions. The new administration may include a cut of about $700 million for such services in its budget, but it would be extremely difficult to implement the reductions.

Net interest

No reductions of interest on the public debt have been included since it is unclear whether the spending cuts will lower the deficit or be used for larger defense increases or for larger tax cuts. If spending cuts were used to lower the deficit, interest costs in 1982 would drop by about $0.6 billion for each $10 billion reduction of the deficit because of a lower level of outstanding interest-bearing debt; by 1983 the savings would be $1.8 billion, if the $10 billion deficit reduction were continued.

Summary

If all the reductions outlined in this article were enacted, the savings would be $12 billion in 1982 and about $20 billion in 1983. These savings would represent about 2.0 percent of nondefense spending in 1982, 3.0 percent in 1983, and approximately 2 percent of total Federal spending in each year. Between 80 and 90 percent of the reductions could be accomplished only by rewriting existing laws rather than through regular appropriations action. The process of changing laws generally requires extended and drawn-out negotiations and is subject to greater delays than appropriations. Because of the time required to negotiate and implement the various changes in current laws, the savings totals in this article are probably an upper limit on what can be achieved through action during the remainder of this year. By comparison, the push for reductions in the fiscal year 1981 budget that started last March probably resulted in nondefense legislated savings of only $4-6 billion, despite the fact that the effort had administration and bipartisan Congressional support for achieving a balanced budget to resist inflationary pressures. However, many of the reductions discussed in this article may be opposed by the Democratic leadership in the House. Also, the target date for a balanced budget appears to be slipping further into the future. Consequently, advocates of spending cuts cannot use the balanced budget argument to defeat amendments that exempt various programs from budget cuts.

An alternative to the goal of a balanced budget is expenditure cuts that offset the revenue loss from a tax cut similar to the first instalment of the Roth-Kemp proposal and from a business tax cut. However, the revenue loss in 1982 from a 10 percent across-the-board cut in individual income tax rates—about $30-35 billion[10]—is by itself in excess of what reasonably can be expected in the way of outlay cuts. A package of

[10] This estimate assumes enactment of a bill by about July 1, 1981 and changes in withholding tables by September 1, 1981. The cut would not be retroactive to January 1, 1981.

cuts that yields significantly more than $10-15 billion for 1982 may not be possible. In general, a larger reduction of total outlays probably would require making additional separate program changes rather than making each of the changes listed in this article more drastic. The program of changes that has already been outlined could occupy most of the time of the first session of the 97th Congress with debate and decisions on Federal spending and consequently could leave little time for consideration of major changes in taxes, Federal regulatory policies, or energy policy. (The tax-writing committees of the Congress are also the committees responsible for social security, medicare, unemployment compensation, and welfare.) Active consideration of more proposals in all likelihood would either be postponed or add to the overall confusion, making it more difficult to achieve any reductions.

The Congress and the administration may have to settle for a longer range goal of offsetting the revenue losses from a tax cut by 1983. For 1983, the revenue loss from a one-time 10 percent cut in rates enacted in 1981 would be about $35 billion. The expenditure savings of $20 billion for 1983 in Table 4 represent estimates of the second-year effects of making permanent the program changes that reduce 1982 outlays. Additional changes that either start in 1983 or begin in 1982 but have no outlay effect in 1982 could probably reduce 1983 outlays by another $10-15 billion, yielding total reductions in 1983 of $30-35 billion. These could include cuts in contributions to international financial institutions, reductions of (or elimination of) future funding for the space shuttle, additional cuts in entitlements, and further reductions of Federal employment. These changes, together with those outlined in this article, could come close to offsetting the income tax cut by 1983 but would probably still fall short of offsetting the $50-55 billion revenue loss from both a 1981 business tax cut and an individual income tax cut.

The possibilities for offsetting the revenue loss from an individual income tax cut earlier than 1983 appear to be limited. A reduction of the defense real growth target might make a difference, but it would entail a major shift in policy. Swift enactment of comprehensive social security and medicare changes that affect all beneficiaries could contribute to an earlier income tax cut, but such changes do not appear likely because of various political considerations and also would be at variance with earlier policy pronouncements. A flood of changes in existing laws well beyond that envisioned in this article could possibly offset an income tax cut by 1982, although both political and time constraints make this extremely difficult. What seems to be clear, however, is that the process of reconsidering basic legislation would need to begin right away, regardless of whether enough changes can be enacted to affect total Federal outlays significantly in the immediate term. Otherwise, unless the Congress begins immediately to consider and to act on numerous changes in current laws, the chances for any spending cuts for 1982 may slip away and the opportunities for reducing spending growth in 1983 and beyond could be severely circumscribed.

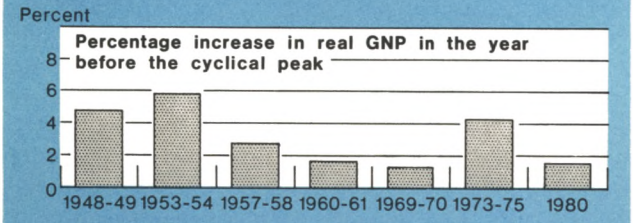
James R. Capra

The business situation
Current developments

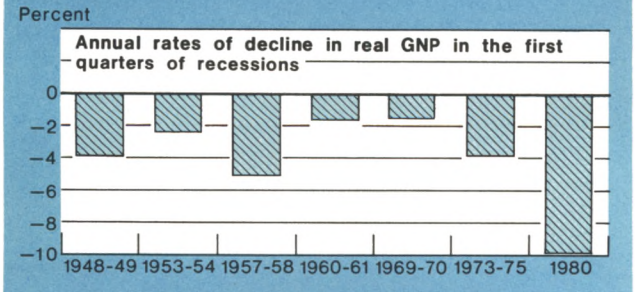
Chart 1

The 1980 recession is unique by postwar standards.*

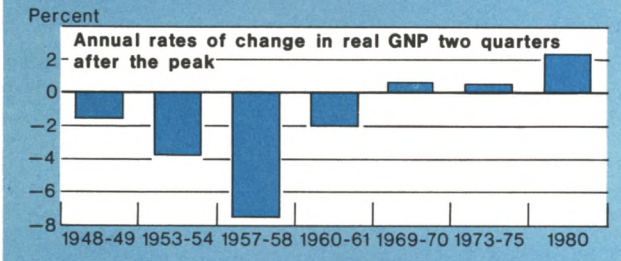
The advance in economic activity during the year before the downturn was very weak . . .



. . . and the decline started off sharply . . .



. . . but the economy seemed to turn quickly around.



*Data for periods preceding 1969 do not reflect latest revisions.

Source: United States Department of Commerce, Bureau of Economic Analysis.

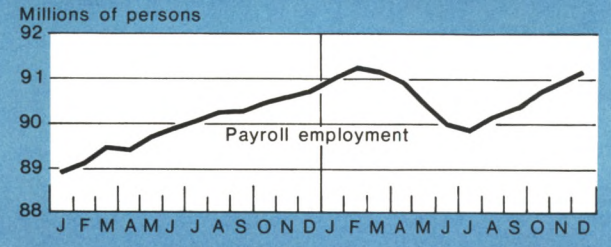
Economic activity advanced in both the third and fourth quarters following the sharp second-quarter decline. The recovery surprised many observers, because it was earlier and more vigorous than had been expected. Industrial production rose more than 7 percent from July to December, reversing about 80 percent of the January-July decline. Construction activity also picked up substantially, and sizable gains were recorded in payroll employment. At the same time, however, there were indications that further substantial growth in early 1981 is unlikely. Retail sales, in constant dollars, were essentially flat from July to November and then tailed off. Domestic auto sales were sluggish, and permits for housing construction began to decline at the end of the year, as interest rates reached the very high levels attained last spring. While the business indicators were mixed, strong inflationary pressures persisted.

The current business cycle has been very different from earlier ones (Chart 1). The 1980 recession was preceded by a year of weak economic growth, and the ensuing downturn in economic activity was very rapid. The 9.9 percent annual rate of decline of real gross national product (GNP) during the second quarter—led by rapid declines in the auto and housing sectors—was the steepest on record in the postwar era and by far the largest decline at the start of a recession. After this abrupt slowdown, the pace of business activity picked up again in the third quarter. By most conventional measures, the 1980 recession should be one of the shortest on record. In terms of its overall magnitude, however, its peak-to-trough decline would be close to the average for previous postwar recessions.

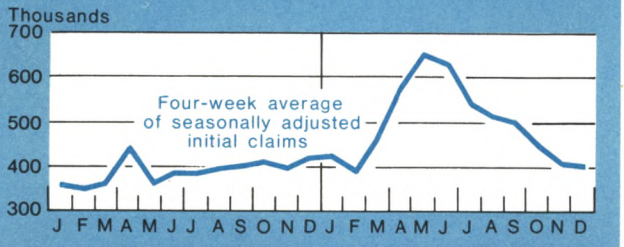
The pattern of the current business cycle has been reflected in the movements of both industrial produc-

Chart 2

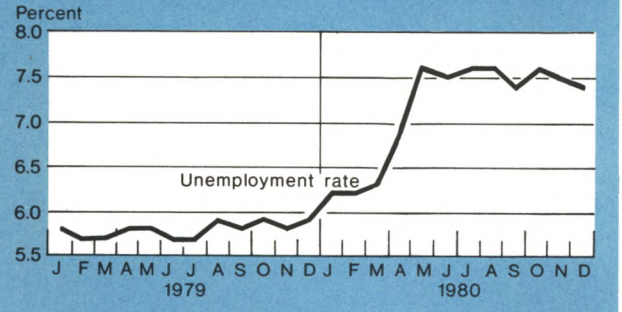
Although there have been significant gains in employment in recent months . . .



. . . and initial claims for unemployment benefits have declined . . .



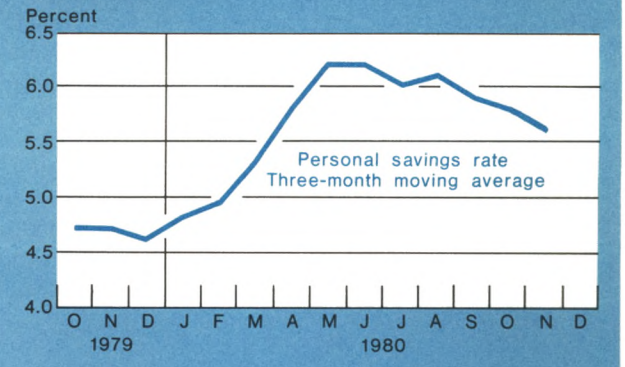
. . . the unemployment rate has remained well above 1979 levels.



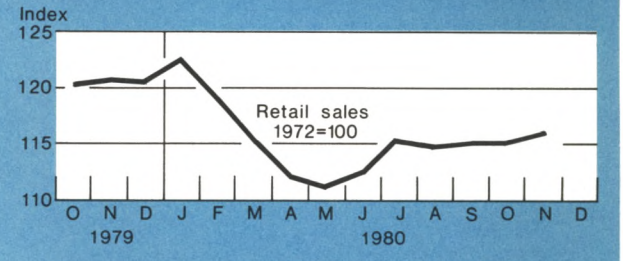
Source: United States Department of Labor, Bureau of Labor Statistics.

Chart 3

Consumers have maintained a higher savings rate . . .



. . . and have not increased purchases.



Source: United States Department of Commerce, Bureau of Economic Analysis.

tion and payroll employment. Industrial output rose more than 7 percent from July to December, the largest five-month gain since late 1975, when the economy was recovering from the last recession. The recent strength has been broadly based, stemming from advances in the production of consumer durables, intermediate products, and basic materials. Reflecting the pickup in economic activity, employment has been rising in recent months, recovering about 95 percent of the February-July decline. But, with the total labor force expanding vigorously through November, the unemployment rate has been in the 7.4 to 7.6 percent range for eight consecutive months (Chart 2).

The domestic auto industry had a central role in the first months of the upturn. Sales were sluggish going into the recession, dropped further during the second quarter, and rebounded—although to still fairly low levels—in the third quarter. By and large, automobile sales for the new-model year have not met producers' expectations. Domestically produced autos sold at an annual rate of 6.5 million in the fourth quarter, just matching the third quarter's sales pace. The new fuel-efficient models were expected to be very popular, but high prices and tight credit conditions still cloud the sales outlook. Uncertain sales prospects and high financing costs have encouraged dealers to maintain low inventories, and this could temporarily delay sales even if demand strengthens.

By historical standards, the housing recovery also has been less than vigorous. Nevertheless, the advance in housing starts—from a 900,000 unit annual rate in May to more than 1.5 million in October, November, and December—contributed substantially to economic growth in the fourth quarter. With interest

rates markedly higher at the year-end, however, building activity showed signs of turning down once more. Single-family housing starts and building permits registered modest declines, but the pace of multifamily starts increased, sustained by work on new apartment buildings to be occupied under Federal rent subsidies. Nevertheless, the total issuance of single- and multifamily permits in December was more than 300,000 below September's rate, signaling a likely reduction of housing activity in coming months.

Weakening demands for new homes and autos fit into a broader picture of stagnant consumer spending. In constant dollars, retail sales were essentially unchanged from July to November after rising by almost 4 percent from May to July. A number of factors make the outlook for consumer spending uncertain. The savings rate remains high in comparison to its level in late 1979 (Chart 3), suggesting that consumers have remained cautious. (Recent data revisions have raised the level of the savings rate but without changing its pattern in the 1979-80 period.) On the other hand, there is evidence that consumers are beginning to borrow once again after the precipitous decline that occurred during the credit restraint program. Outstanding consumer credit grew by $3 billion from July to November, offsetting 40 percent of the March-July decline.

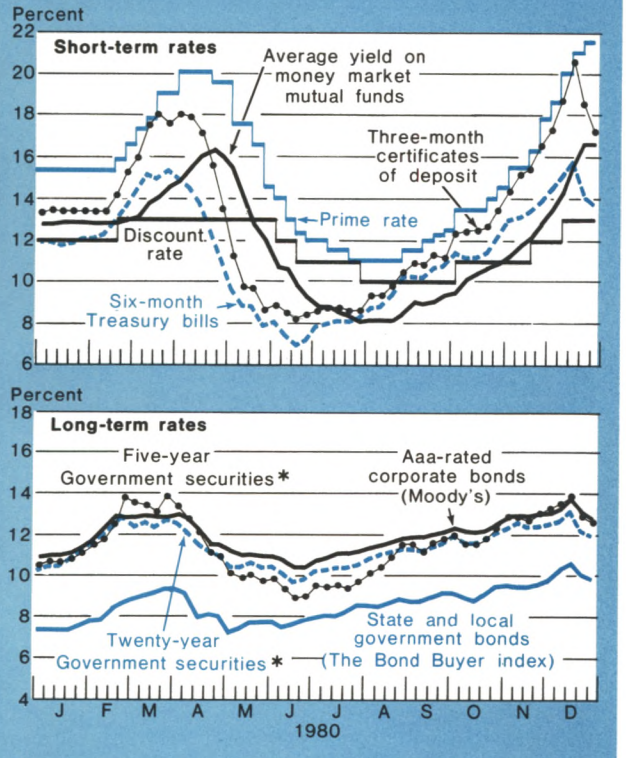
Despite the legacy of the sharp recession in the first half of 1980, inflation continued at a rapid rate. The consumer price index increased at a 12 percent annual rate in the September-November period, boosted by the volatile mortgage rate and food price components. The latest statistics on wage increases also suggest strong inflationary pressure. Average hourly earnings in manufacturing, adjusted for interindustry shifts, rose at a strong 9 percent annual rate in the fourth quarter. However, this was considerably slower than the previous three quarters, suggesting that inflationary pressure, while still strong, may be easing somewhat.

With the uncertain outlook for auto sales, and high interest rates causing housing to slow, it is unlikely that the recent advance in business activity—if it lasts—will have the vigor of the early stages of past expansions. Given current economic conditions, it would take remarkable strength in several sectors of the economy to achieve a robust expansion, despite the prospects for some additional stimulus in the coming year from tax cuts and increased defense spending. Moreover, these sources of strength are likely to be offset, at least in part, by weakening export demand as the economies of other major industrial nations experience slowdowns.

The financial markets Current developments

Chart 1

After rising sharply for several months, interest rates declined in the final weeks of the year.



* These yields are adjusted to five-year and twenty-year maturities and exclude bonds with special estate tax privileges.

Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, Moody's Investors Service, The Bond Buyer, and Donoghue's Money Fund Report of Holliston, Massachusetts.

Financial markets tightened throughout most of the fourth quarter as interest rates approached and in many cases exceeded the record highs of last spring. But, in the final weeks of the year, interest rates declined (Chart 1) as the market reacted to slower money supply growth and indications that the economy would be weakening. For most of the fourth quarter, however, the financial markets were responding to news of a much stronger than expected economy and very rapid money supply growth. As a result, the three-month bill rate rose from about 11 percent at the end of September to 16.7 percent in the week of December 17. To keep the discount rate in line with other market rates and to restrain the rapid growth of money and credit, the Federal Reserve raised the discount rate twice during the fourth quarter to a level of 13 percent and imposed a surcharge on frequent borrowers from the discount window.[1]

Partly as a result of the strengthening in economic activity in the second half of the year, M-1B rose at a 10.5 percent annual rate, compared with 2.3 percent in the first half of the year. But the rapid growth of M-1B did not stem only from the strengthening in economic activity. A considerable volume of funds were shifted from savings deposits, which are not part of M-1B, into automatic transfer accounts (ATS) which are a component of M-1B; ATS accounts, negotiable order of withdrawal accounts (NOWs), and credit union share drafts comprise the "other checkable deposit" component of M-1B. The inflow of funds from savings

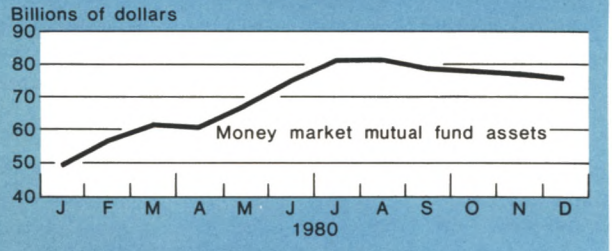
[1] The surcharge above the basic discount rate, which was set at 2 percentage points on November 17 and increased to 3 percentage points on December 5, applies only to borrowings for "adjustment purposes" by institutions with deposits of $500 million or more and is charged when such borrowings occur in two or more successive weeks in a calendar quarter or when borrowings take place in more than four weeks in a calendar quarter.

accounts into ATS accounts during the latter half of 1980 was concentrated at commercial banks outside the New York, New Jersey, and New England geographic area. Apparently, these banks were promoting ATS accounts aggressively in advance of the introduction of nationwide NOW accounts for all financial institutions as of December 31 to solidify in advance market shares for interest-bearing checkable deposits. Furthermore, to the extent that these ATS accounts replace prospective NOW accounts, reserve require-

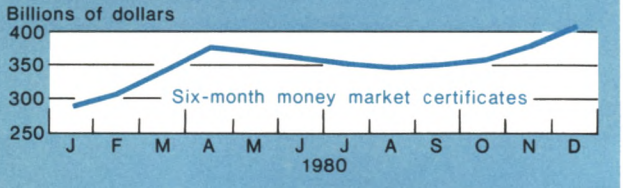
Chart 2

With short-term interest rates rising, the spread between market rates and the return on money market funds became positive after July . . .

. . . leading to a decline in the assets of money market funds . . .



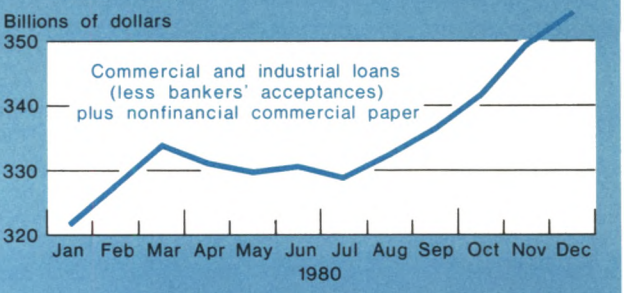
. . . and encouraging growth of six-month certificates.



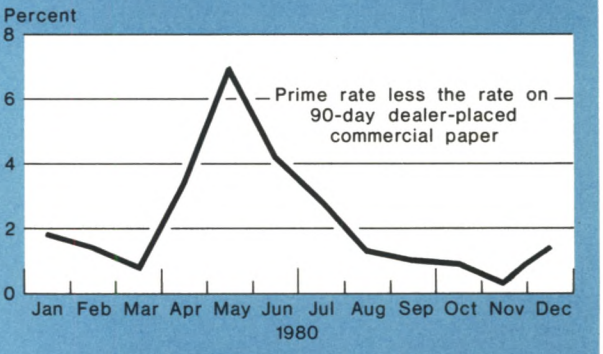
Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, and Donoghue's Money Fund Report of Holliston, Massachusetts.

Chart 3

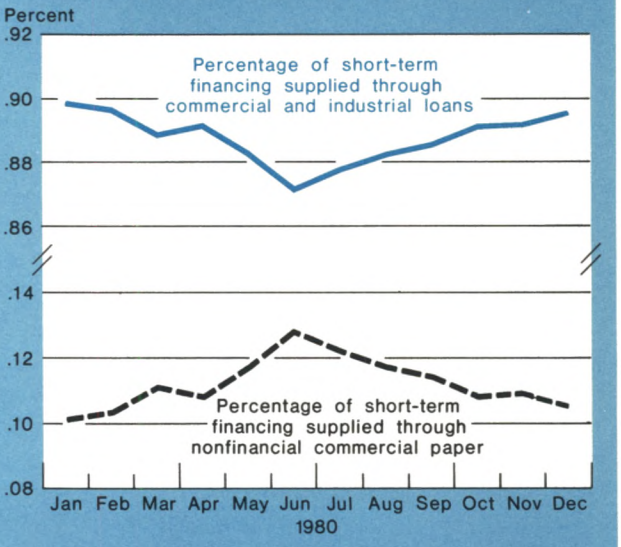
While the demand for short-term business credit has increased sharply since July . . .



. . . the spread between the prime rate and the commercial paper rate has narrowed . . .



. . . and a larger share of short-term financing has been provided by banks.



Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System.

ments of these banks will be reduced for a while, since requirements on ATS accounts will be phased in from the previous ratio required against savings deposits (3 percent) to the higher level required against transaction accounts (12 percent for deposits in excess of $25 million). On the other hand, reserve requirements on NOW accounts outside New York, New Jersey, and New England will be at the level for transaction accounts immediately.

The rapid growth of other checkable deposits during the second half of 1980 makes it difficult to interpret the growth of the narrow monetary aggregates —M-1A and M-1B—relative to the annual targets for 1980 that were set by the Federal Open Market Committee (FOMC) last February. From the fourth quarter of 1979 to the fourth quarter of 1980, M-1B increased at an annual rate of 7.3 percent, about ¾ percentage point above the 6.5 percent upper limit set for 1980, while M-1A advanced at a 5.0 percent rate, well within the 6.0 percent upper limit of its annual range. The upper limits of the M-1A and M-1B targets were set with a ½ percentage point spread, assuming only negligible effects from ATS and NOW accounts. As it turned out, however, the spread between the annual growth rates of M-1A and M-1B was 2.3 percentage points as the public shifted a larger than expected volume of funds from demand deposits and savings deposits into other checkable deposits. After allowing for these unexpected shifts, both M-1A and M-1B increased at rates roughly equal to the upper limits of their respective annual ranges. The broad aggregates—M-2 and M-3—also showed strong growth during the second half of the year and recorded growth rates of 9.9 percent and 10.0 percent, respectively, slightly above the 1980 targets.

The introduction of nationwide NOW accounts on December 31, 1980 will continue to complicate the interpretation of the narrow monetary aggregates during 1981. As funds shift from demand deposits into NOW accounts, the growth of M-1A will continue to be reduced. This particular shift will not affect M-1B growth because both components are included in the definition of M-1B. However, other funds, primarily savings deposits, will also be moved into NOW accounts, which will add to M-1B growth in the same way that shifts of savings deposits into ATS accounts added to M-1B growth in 1980. As a result of funds shifting from demand and savings deposits into NOW accounts, M-1B growth is likely to be considerably stronger than M-1A growth during 1981.

Reflecting the strong demand for money during the fourth quarter, short-term interest rates increased sharply. The rate on six-month Treasury bills rose from about 11.5 percent at the end of September to 15.7 percent in mid-December. As a result of the higher yields which were consequently available on six-month money market certificates, the public invested a large volume of funds in these certificates at banks and thrift institutions during the latter part of the year (Chart 2). At the same time, the average yield on the assets of money market mutual funds increased from a low of about 8 percent during the summer months to 16.6 percent at the year-end. However, since the yield on money market mutual funds rises only gradually as portions of the existing portfolio of money market instruments mature and are reinvested, the return tends to lag behind other market rates. Consequently, the assets of money market funds declined during the fourth quarter. In contrast, during a period of declining interest rates, money market mutual funds should be more attractive than other market instruments because the yield would not fall so quickly.

The rapid increase in interest rates occurred during a period of strong demand for short-term business credit. Commercial and industrial loans exclusive of bankers' acceptances plus commercial paper issued by nonfinancial corporations expanded at an 18.7 percent annual rate between July and December (Chart 3). In part, this overall strength stems from the increased cost of borrowing in the long-term debt market. During the fourth quarter, rates on long-term corporate bonds were as much as 3¼ percentage points above the trough level recorded last summer. Many corporations became reluctant to incur such high borrowing costs on a long-term basis and turned instead to short-term sources of credit to meet their financing needs. As a result, new corporate bond offerings averaged only about $2.8 billion per month during the fourth quarter, compared with $5.6 billion during the spring and summer months.

As corporations turned to the short-term market, the interest rate spread between commercial paper and the prime rate was an important factor contributing to the composition of their short-term borrowing. Even though the prime rate rose to a record 21½ percent by the end of December, commercial paper rates rose by a greater amount and, as a result, corporations raised a larger proportion of their short-term credit needs at banks rather than in the commercial paper market. Another factor contributing to greater reliance on bank loans was the downgrading of several large issuers of commercial paper.

Global Payments Problems

The Outlook for 1981

Since late in 1978, oil prices have risen sharply and the major oil-exporting countries have again amassed large financial surpluses. Correspondingly large deficits have been contracted by oil-consuming nations. With political tensions in the world's major oil-producing region at a new high, the questions of how large these deficits and surpluses may become and how long they can persist have taken on renewed urgency. This article reviews recent developments and considers the 1981 outlook for international payments of the Organization of Petroleum Exporting Countries (OPEC) members and the non-OPEC developing countries.[1] The industrial country members of the Organization for Economic Cooperation and Development (OECD) also face serious problems. But, except for a couple of the least developed OECD members, the central problem is to reduce oil demand with minimum adverse effects on employment and inflation rather than how to finance the oil imports. Less developed countries (LDCs), too, must adjust to higher oil prices, but these adjustments at best take time. With their often limited capacity to adjust and limited sources of external funds, many LDCs find that their external financing constraint quickly binds. The forced adjustment that then results tends to be more costly than necessary.

The combined current account of members of OPEC grew from near balance in 1978 to a surplus of over $110 billion by 1980 (Chart 1). Most of this increase was against the OECD member countries. The OECD accounts for nearly 90 percent of the world's oil imports, and by 1980 its aggregate current account had deteriorated to an estimated deficit of over $75 billion from a surplus of under $10 billion in 1978. Meanwhile, the combined deficit of non-OPEC developing countries widened from about $25 billion to over $50 billion.

The outlook for 1981 is critically dependent on very uncertain oil prices, so that two different price scenarios are considered. If the recent Iran-Iraq supply interruptions are overcome early in 1981, an increase in the oil price at least in line with inflation in industrial countries is likely. A 12 percent OPEC oil price increase on average from 1980, along with a continued rapid rise in their imports would reduce the OPEC current account surplus to about $80 billion. The economic slowdown in major industrial countries is expected to continue, and this would lower the combined OECD deficit some $30 billion to around $45 billion. The deficit of the non-OPEC developing countries, on the other hand, would be expected to rise nearly $10 billion to around $60 billion, as prices of their primary commodity exports stagnate in the face of weaker demand in the industrial world. Even this scenario assumes that developing countries maintain a tight check on real import growth as their deficits are constrained by the availability of finance.

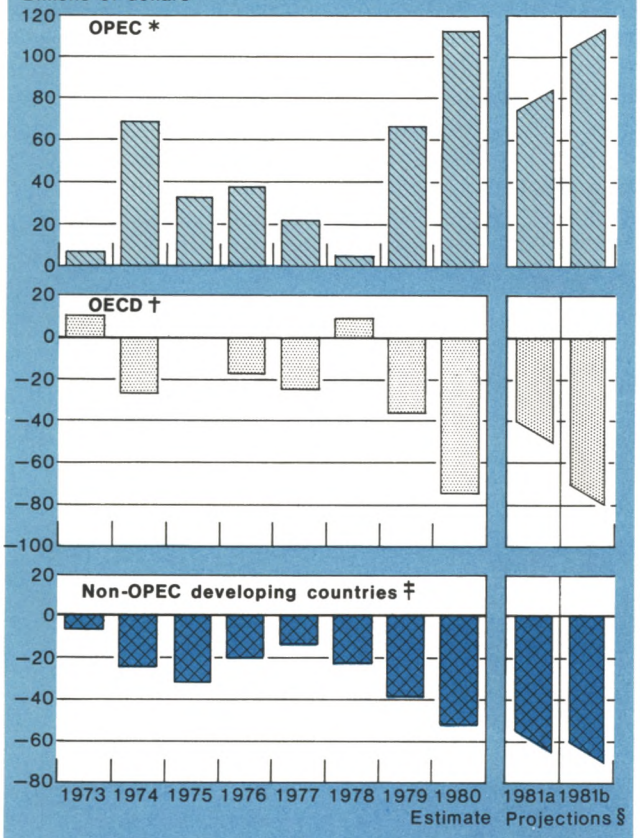
A higher price of oil in 1981 would result in a larger OPEC surplus and a larger OECD deficit. For instance, if the average oil price received by OPEC rises 25 percent to $40 per barrel for the year, their surplus would again exceed $100 billion. Most of this increase

[1] The definition of non-OPEC developing countries used here excludes southern Europe, China, and South Africa. In discussions of gross bank finance and gross oil trade, data for offshore financial centers and offshore refining centers are excluded as well.

Chart 1

Global Current Account Balances

Billions of dollars



* Members of the Organization of Petroleum Exporting Countries (OPEC).

† Members of the Organization for Economic Cooperation and Development (OECD).

‡ Excludes eastern and southern European countries, China, and South Africa.

§ Projection 1981a assumes a $35 per barrel average OPEC contract price for oil, while the 1981b projection assumes a $40 per barrel average price.

Sources: OECD, International Monetary Fund (IMF); Federal Reserve Bank of New York estimates, projections, and adjustments for consistent country coverage.

again would be reflected in the deficit of the OECD area. As a group, these countries would not have a serious financial constraint so long as they continue to attract the bulk of OPEC investments. Non-OPEC developing countries, a few of which would gain from an oil price rise, would face a further $5 billion erosion in their current account, bringing it to near $65 billion. The oil-importing countries in this group would have to cover a $10 billion higher oil bill. Because oil imports are concentrated in a few countries, the higher oil price could present serious financing problems for individual countries even though it produces only a small increase in the combined deficit. In this context, it has to be kept in mind that payments interruptions by one or more of the major debtor countries could raise the cost of borrowing for all and compound the adjustment problem for others.

OPEC

The combined OPEC current account surplus is now estimated at about $110 billion in 1980, up from only about $5 billion two years earlier (Chart 2). The group's annual export receipts more than doubled to over $300 billion during this period, as the 140 percent surge in oil prices dominated a 10 percent decline in oil production and export volume. But, by 1980, more than a third of the $150 billion increase in export revenue was being spent on current import and transfer payments abroad. These payments responded slowly at first to the rising oil receipts. Most OPEC members entered 1979 with relatively austere plans for economic development and imports. Their emerging fiscal and balance-of-payments deficits between 1976 and 1978 led most OPEC countries to cut back their import-intensive government spending plans. However, by early 1980, OPEC real import growth once again appears to have been in excess of 20 percent per year. As a result, merchandise imports are estimated to have risen to about $140 billion in 1980, nearly $40 billion above their 1978 level. Moreover, the OPEC deficit on net services and transfer payments has risen about $10 billion since 1978 to more than $50 billion despite growing earnings on OPEC investments abroad.

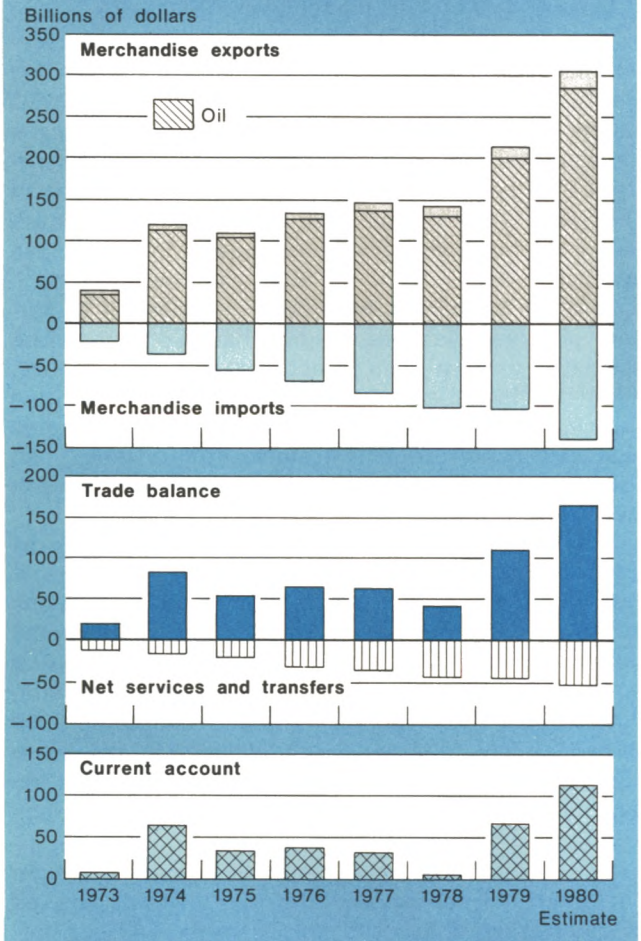
Real OPEC imports are likely to remain strong as Iraq and Iran reconstruct war damage, or at least rearm. Moreover, the heightened political tensions will likely increase arms purchases elsewhere in the region. If oil prices remain about constant in real terms (a 12 percent nominal year-over-year growth), this continued rise in imports would reduce the 1981 OPEC surplus to around $80 billion. On the other hand, a 25 percent increase in oil prices to around $40 per barrel for the year average would again produce a surplus in excess of $100 billion.

The conditions under which a higher oil price might occur are not implausible. The Iraq-Iran war has, as of this writing, driven spot prices to the $40 per barrel range and led OPEC to announce increases in their posted prices to an average of about $35 per barrel. However, the OPEC price structure remains split. Under announced plans, Saudi Arabian prices

still remain below those of equivalent grade oil from other Middle Eastern producers while prices for higher quality African crude oils remain well above their traditional premia. These price differentials seem unlikely to be sustained, but it is unclear whether market forces will dictate cuts in the premium prices being charged by Algeria, Libya, and Nigeria or induce Saudi Arabia and other price moderates to reconsider their discounts. The lower price scenario is consistent with an early return of Iran and Iraq production and exports to near their prewar levels, and no additional supply disruptions elsewhere. With sluggish activity in industrial countries, this would return the world oil market to the oversupply situation that was apparent in the third quarter of 1980. Then, inventories had reached record levels and spot prices were falling, even though OPEC production had declined more than 10 percent from its level a year earlier. This outcome would allow a consolidation of OPEC prices around the $35 per barrel level. Production cutbacks by the high surplus Arabian Gulf producers in line with their longer term plans would prevent a further price erosion. On the other hand, a prolongation of hostilities, a spread of the war, or new political disruptions in

Chart 2

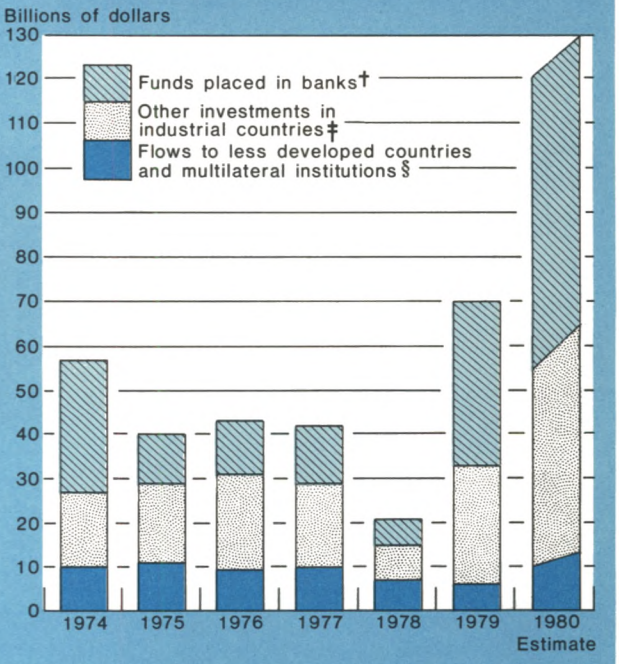
OPEC Current Account



Sources: IMF; Federal Reserve Bank of New York estimates and adjustments for country coverage.

Chart 3

Disposition of OPEC Surplus*



* The total surplus available for disposition equals the OPEC balance on goods, services, and private transfers plus borrowings by OPEC members plus adjustments for leads and lags of oil-export receipts.

† Increase in liabilities of banks in industrial countries as reported to the Bank for International Settlements (BIS).

‡ Includes direct investment, loans, portfolio investment, and unrecorded items.

§ Excludes purchases of World Bank bonds in international capital markets.

Sources: IMF, OECD, BIS; Federal Reserve Bank of New York estimates and adjustments for country coverage.

other major oil-producing countries could tighten the oil market substantially and produce another run-up in oil prices. While one can easily imagine even higher oil price projections based on worsening political scenarios for the Middle East, the $40 per barrel oil price assumption provides the flavor of their impact.

In investing its surplus, OPEC continues to favor low-risk investments, particularly government securities of major countries and deposits in large international banks (Chart 3). The effect has been to shift the job of lending to most oil-importing countries—including developing countries—over to banks and other participants in the world capital markets. At least three quarters of the available OPEC surplus in 1979 and 1980 was invested in industrial countries or in Eurocurrency deposits of banks from these countries, and the banks alone have taken about half the surplus. The remaining quarter includes direct credits to developing countries, indirect funding through multinational organizations, and unrecorded items. Direct and indirect assistance to other developing countries has not grown in real terms since 1974 and has fallen far short of the growth of the OPEC surplus in the last two years.

Under the lower oil price scenario for 1981, the level of OPEC lending to LDCs would increase little from the $10-12 billion estimated for 1980. In the past during periods of declining surplus, such lending has fallen back although with a lag. Also, as in the past, much of this lending would be in the form of concessional loans and would follow the political ties of the high surplus OPEC members with Middle Eastern and North African countries. Increased OPEC investments at market-related terms may be anticipated. However, these investments probably would compete with bank lending in those few more advanced developing countries that are adjusting well to the oil shock, rather than complement bank lending in countries where adjustment proves more difficult.

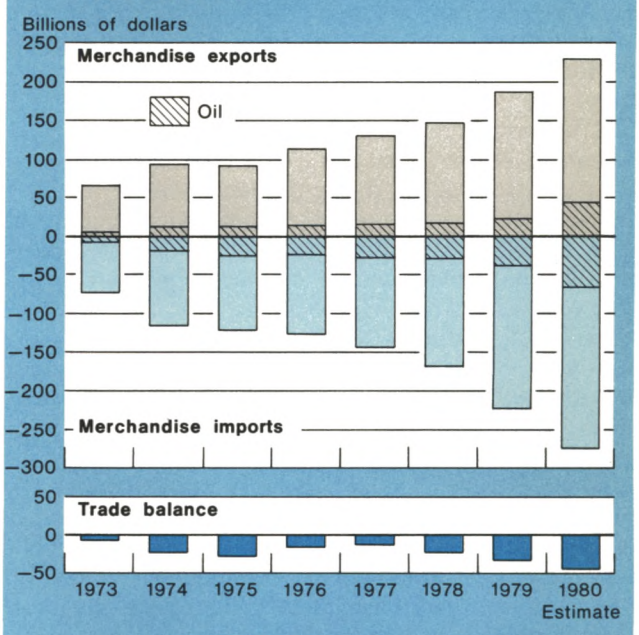
The main difference under the alternative higher surplus scenario would be increased bank placements. Some increase in direct LDC assistance and the funding of multilateral institutions might also be possible, but the past growth and direction of these flows suggest they would not compensate for the additional oil cost to many LDCs without a serious effort to augment official recycling.

Non-OPEC developing countries

The non-OPEC developing country current account deficit mounted to over $50 billion in 1980, more than double its level two years earlier. This deterioration was nearly equal to the $35 billion growth of the annual oil-import bill of the group over the period (Chart 4).

Chart 4

Non-OPEC Developing Countries' Trade Account



Sources: IMF, OECD; Federal Reserve Bank of New York estimates and adjustments for country coverage.

But the direct impact of higher oil prices on the developing countries is very uneven. Four countries—Brazil, India, Korea, and Taiwan—account for nearly half of the group's oil-import bill. These four also accounted for about half of the deterioration of the deficit. Many smaller countries with less export or borrowing potential have been even more seriously affected in proportion to their own income and output. At the other extreme, those developing country oil exporters that are not members of OPEC showed about a $15 billion increase in net oil receipts over the 1978-80 period.[2] These countries have expanded their oil production nearly 25 percent since 1978, but their domestic oil consumption and nonoil imports have also grown. As a result, they showed only a modest $2 billion improvement in their current account deficit by 1980.

[2] The major non-OPEC developing country oil exporters are Mexico, Oman, Trinidad and Tobago, Egypt, Malaysia, Angola, Bahrain, Peru, Syria, and Tunisia.

On top of their higher oil-import bill, developing country exports have suffered from weakening demand in their markets in industrial countries. The slowdown in real gross national product (GNP) growth of the industrial countries during 1979-80 cut 1980 developing country exports $10 billion to $15 billion below what they would have been. Moreover, the full impact of this slowdown has not yet been felt. Primary commodities prices were relatively strong for LDC exporters until just recently and rose about 35 percent over the past two years. But the increases were concentrated in a few products—sugar, copper, tin, and rubber—and benefited only some countries. Many developing countries also import primary commodities, particularly foods, and have been hurt by the nearly 40 percent rise in grain prices.

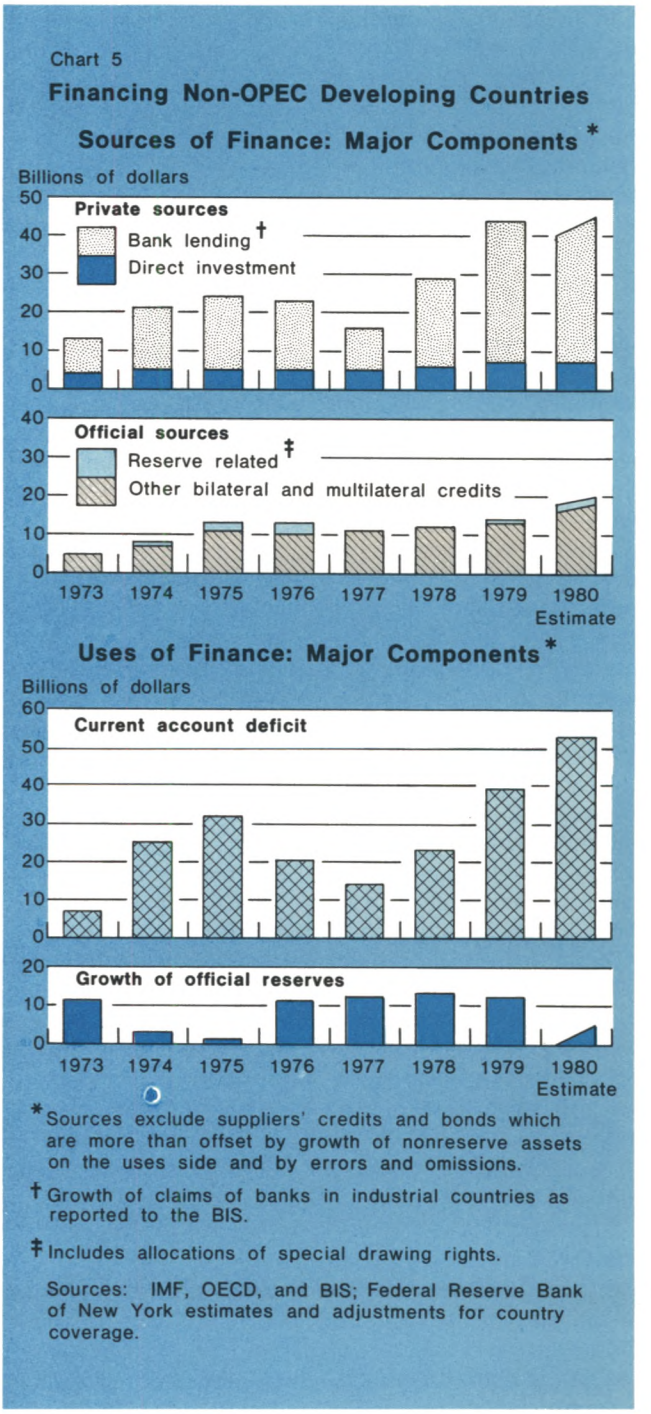
For 1981, the non-OPEC developing country current account deficit is projected to widen to about $60 billion, if oil prices remain constant in real terms. The further slowing in industrial country growth and the weaker commodities prices will further reduce the growth of export receipts. Thus, most of the deterioration will be reflected in the trade account, even if real import growth is again held to about 3 percent. The outlook for commodities prices is mixed. Most prices have been falling since the third quarter of 1980, and only grains appear to have much potential for a strong 1981 performance. As a result, the terms of trade for developing countries is projected to deteriorate about 2 percent. Moreover, the relatively strong grain prices will help only a few and hurt the low income food-importing countries who may least be able to finance larger deficits.

A run-up in oil prices to $40 per barrel would add another $5 billion to the combined developing country deficit in 1981, widening it to around $65 billion. But the $10 billion addition to the oil bill that this price brings would again be concentrated in a few oil-dependent, newly industrialized countries. Moreover, those least developed countries where oil import payments already consume a heavy share of export receipts would be forced to cut real imports and their economic growth further. Some may not have the option of running a larger deficit. Most of these countries will not be helped by the $7 billion increase in receipts that would accrue to the few LDC oil exporters that are not OPEC members as the real oil price rises. The indirect effects of the price hike could add perhaps $1-2 billion to the 1981 deficit, after allowing for a pickup in LDC exports to OPEC members. On the basis of past experience, however, these indirect effects work slowly. Thus, the further slowing of activity in industrial countries brought by higher oil prices would depress developing country exports well into 1982 when even larger LDC deficits would be expected.

The above projections for developing country deficits assume they can be financed. Past and emerging financing trends provide a guide as to how this might

Chart 5

Financing Non-OPEC Developing Countries



* Sources exclude suppliers' credits and bonds which are more than offset by growth of nonreserve assets on the uses side and by errors and omissions.

† Growth of claims of banks in industrial countries as reported to the BIS.

‡ Includes allocations of special drawing rights.

Sources: IMF, OECD, and BIS; Federal Reserve Bank of New York estimates and adjustments for country coverage.

be accomplished (Chart 5). In the past, bank lending[3] has been the major source of finance as well as the source most responsive to changes in LDC deficits. But this bank lending has been concentrated in a few of the more advanced non-OPEC developing countries. Just ten countries[4] account for nearly 75 percent of outstanding international bank credits, and since 1978 four of these countries—Brazil, Mexico, Argentina, and South Korea—have received two thirds of the net new bank lending to the group of more than 100 individual countries. The remaining developing countries have relied heavily on official source credits to finance their deficits. Except for reserve-related lending, mostly from the International Monetary Fund (IMF), these credits grew only slowly during the 1974-75 and 1978-79 periods of rising LDC deficits. Bilateral (government-to-government) lending usually requires legislative approval in industrial democracies, and developing country finance often takes low priority in times of economic contraction at home. Multilateral loans and credits (from the World Bank and regional development banks) are linked mostly to project finance and are disbursed only as these projects progress.

Financing the $60 billion 1981 deficit anticipated for non-OPEC developing countries, if real oil prices remain constant, does not appear unsurmountable. Problems for individual countries doubtlessly would remain, and there would be little room for reserve asset accumulation for the group as a whole. However, a relatively modest growth of official finance and direct investment, along with continued bank lending at its recent rate, would cover the overall deficit. Official source credits should continue to grow, principally because of stepped-up IMF and World Bank lending. Official financing is estimated to have grown from $14 billion in 1979 to near $20 billion in 1980. An increase to around $25 billion in 1981 appears reasonable. Recent increases in IMF quotas and guidelines on maximum lending to individual countries, as well as stepped-up disbursements on World Bank project and structural adjustment loans, should make up a good part of this increase. Private source credits would still have to provide nearly $40 billion of the financing under this scenario, mostly in the form of bank lending. The growth of bank claims could be somewhat less than the $36 billion reported in 1979 and about in line with the increase now estimated for 1980. This would represent about a 20 percent growth of bank claims on non-OPEC developing countries, somewhat below the average growth rate since 1975.

The $40 per barrel oil price scenario calls for only a $5 billion larger combined deficit, but little additional official lending can confidently be expected. An additional $5 billion in bank loans might not be out of the question, particularly if the lending spreads were to widen. However, some of the countries that would be hardest hit by the $10 billion rise in the LDC oil bill may already have stretched their borrowing capacity to the limit. Domestic political constraints may make it impossible for them to reduce real imports enough to avoid payments interruptions. Interruptions in trade credit or debt service payments would not entail a broad or permanent default on existing loans. Interruptions, however, would lead to difficult and possibly prolonged periods of negotiation to restructure the debt and reestablish credit. During these periods, new credit to the country concerned would be sharply curtailed. Forced import cuts would then reduce the current account deficit to meet available finance. If these interruptions arise in a couple of the countries that account for most bank credits, a drop in the overall rate of bank lending and in the overall deficit is possible. In any event, the increasing incidence of problems in individual developing countries could cause a retrenchment of bank lending in general and aggravate the adjustment problems in otherwise sound countries.

William J. Gasser

[3] Bank lending is defined here to comprise the total increase in claims on non-OPEC developing countries of banks in industrial countries, as reported to the Bank for International Settlements. This is a lending-net-of-repayments concept which includes short-term credits and loans to the private sectors of developing countries which may not carry government guarantees.

[4] The ten major non-OPEC developing country debtors to commercial banks are Argentina, Brazil, Chile, Colombia, Korea, Mexico, Peru, Philippines, Taiwan, and Thailand.

Oil Price Decontrol and Beyond

Price controls on United States domestically produced crude oil are currently being eliminated,* marking an important step toward resolving our energy problem. Oil price decontrol is one key part of a broader national initiative, which includes decontrol of natural gas prices, encouragement of alternative energy sources, and incentives for greater conservation and efficiency. The main purpose of these efforts is to reduce our dependence on increasingly costly and uncertain supplies of foreign oil.

Decontrol of domestic oil will have several important effects. First, by October 1981, when decontrol is scheduled to be completed, United States refined petroleum prices will be at least 20 to 30 cents per gallon higher than they would be without decontrol. Second, a price rise of this magnitude should lower United States petroleum usage about 1 million barrels per day. Third, since higher prices appear to have stimulated United States crude oil production, the total impact of decontrol on United States imports is probably greater than 1 million barrels daily. Fourth, by raising the responsiveness of our oil imports to foreign prices, dropping the controls mechanism raises United States resistance to future foreign price increases. If the completion date for decontrol is moved to earlier in 1981, its full effects would come sooner and more abruptly but in other respects would be basically the same as those outlined here.

There is, however, good reason to believe that the mere decontrol of domestic crude oil prices does not go far enough. Because of the potentially devastating effects of petroleum supply disruptions on the United States economy, the cost of imported oil clearly exceeds its dollar price. Further steps beyond decontrol, therefore, are called for to discourage imports. Tax policies which effectively raise the relative price of petroleum in the United States would be a logical extension of the decontrol strategy.

The price-control mechanism

Before examining the implications of decontrol, it is helpful to review the basic elements of the price-control system which is being phased out. United States crude oil price ceilings originated in the general wage-price restraints of the early 1970s, but the basic form of the current controls evolved from the Energy Policy and Conservation Act of 1975.[1] Domestically produced crude oil was divided into two main categories, essentially based on the age and productivity of wells. Oil from older wells, labeled "lower tier" oil, was given a price ceiling below the ceiling for "upper tier" oil, which was produced from newer wells (or stepped-up output from older wells). In 1976, production from small "stripper" wells—wells producing under ten barrels daily—was decontrolled.[2]

The ceilings kept the average price of domestic oil below the cost of imported oil. Without controls, re-

* This article was written prior to President Reagan's recent announcement immediately ending all price controls on crude oil and petroleum products. As noted in the text, this does not substantially change our conclusions.

[1] For a description of how Federal petroleum regulations evolved since the 1930s, see Paul A. MacAvoy, ed., *Federal Energy Administration Regulation,* American Enterprise Institute for Policy Research (Washington, D.C., 1977).

[2] Oil from the Naval Petroleum Reserve, which has never accounted for more than 1.6 percent of total domestic production, was also exempt from price regulations.

finers would be willing to pay a similar price, including transportation costs, for crude oil from both foreign and domestic suppliers. For example, in the fourth quarter of 1978 the average price of foreign oil delivered to United States refiners was $14.77 per barrel. Stripper oil, which accounted for 15 percent of domestic United States production, received an uncontrolled price of $14.54 per barrel, close to the import price. Due to wellhead ceilings, however, the 35 percent of United States output classified as lower tier received only $6.14 per barrel. Upper tier oil (excluding Alaskan) was priced at $13.00 per barrel and accounted for 35 percent of domestic oil. Alaskan North Slope oil, which at the time made up 14 percent of United States output, also was technically subject to the upper tier wellhead ceiling but, due to high transportation costs, actually received a wellhead price less than the ceiling in order to stay competitive with uncontrolled oil from other sources.[3] For all domestic oil, the combined average cost to refiners, including transportation, was $10.88 per barrel, well below the average import price.

The price ceilings were pegged to the implicit gross national product (GNP) price deflator. Although this has permitted the ceilings to keep pace with the inflation rate, foreign oil prices since the end of 1978 have risen much more than the general price level, causing the gap between the domestic ceilings and the price of imports to widen.

Merely holding down domestic crude oil prices, however, would not guarantee that prices paid by consumers of refined products would be lower. The domestic price level for refined petroleum must be high enough to make it profitable to refine and market not only price-controlled oil but also oil from every other source needed to satisfy total domestic demand, including expensive foreign supplies. Thus, if left alone, refined products prices would reflect the high cost of foreign oil. Refiners of imported oil would cover their costs, and refiners with access to price-controlled oil would be in a very profitable situation. To make sure that United States refined petroleum prices were indeed lower, and to remedy the potential inequities among refiners, an import subsidy was enacted as part of a system of crude oil "entitlements" to complement the crude oil price controls.[4]

[3] At the wellhead, Alaskan North Slope oil received an average price of $5.22 per barrel in 1978, compared with $12.15 per barrel for other upper tier oil. At the refinery gate, Alaskan oil generally received at least as much as other upper tier, and often more.

[4] In addition, until mid-1976, prices of most refined products were controlled directly. Currently, gasoline is the only major refined product category subject to direct price controls, but these controls apparently are not effectively binding much of the time.

Under the entitlements program, refiners of price-controlled crude oil pay a uniform per-barrel subsidy to refiners of imported and uncontrolled domestic crude oil. The subsidy lowers the effective cost of refining foreign or uncontrolled domestic oil, thereby lowering the price level of refined products. At the same time, the required payment raises the average effective cost of refining price-controlled oil, making it approximately equal, on balance, to the average effective cost of foreign and uncontrolled domestic oil.[5] The average effective cost of all oil to United States refiners, therefore, is below the price of imported crude.

Since the entitlements payments roughly equalize the average effective cost of imported and price-controlled crude oil, the size of the subsidy automatically rises when the import price increases relative to domestic price ceilings.[6] For example, between December 1978 and May 1980, the average delivered price of imported crude oil to refiners rose from $14.94 per barrel to $34.33 per barrel. Over this period, the lower tier wellhead price ceiling increased only from $5.68 to $6.47, reflecting general price inflation. As a result, the import subsidy, which was $1.27 in December 1978, jumped to $6.22 per barrel by May 1980.

Prices of United States refined products can rise faster than average effective crude oil costs during a tight world market. Since the import subsidy is paid on a uniform per-barrel basis, it does not always fully offset the higher crude oil costs paid by those refiners who are forced to seek supplies from particularly expensive foreign sources. Even if most officially posted foreign contract prices remain unchanged during a world shortage, refiners without sufficient contractual supplies may find it unprofitable to turn to more expensive sources unless United States refined product prices rise. Under these circumstances, if the extra supplies are needed to meet domestic demand, refined product prices in the United States can rise considerably, even though the average effective cost of all foreign oil increases much less. The spread between refined products prices and average effective crude oil costs therefore rises. Conversely, during a glut on the world market, refiners can buy oil for less than the

[5] The required payment per barrel of upper tier crude oil is less than the payment per barrel of lower tier oil by just enough to equalize the effective costs of these two categories of crude oil. For a more detailed description of the system, see Kay Sherwood, "Crude Oil Entitlements Program", *Monthly Energy Review* (January 1977).

[6] More exactly, the entitlements system approximately equalizes the average effective cost of price-controlled oil and the average combined effective cost of imported and uncontrolled domestic crude oil. Most of the time, however, market forces cause the price of uncontrolled domestic oil to be about the same as the import price.

long-term contract prices and, receiving the same per-barrel subsidy as other importers, can force down United States refined products prices relative to the average effective cost of all imported oil. Over the long run, United States refined products prices would be held below the level consistent with average imported oil prices by an amount corresponding to the import subsidy, but in the short run the spread between United States refined products prices and average effective crude oil costs can fluctuate in response to shortages or gluts on the world market.

For example, suppose the price charged for most imported oil was $30 per barrel but, for domestic demand to be satisfied, some oil would have to be imported at $40 per barrel. Unless domestic refined products prices were high enough to make importing the more expensive oil profitable, refiners would not buy it, and the resulting shortage would drive up the price of refined petroleum in the United States until it reflected the $40 per barrel cost less the uniform subsidy. Since the bulk of crude oil was still being bought at controlled domestic prices or at the $30 per barrel import price, the spread between refined products prices and average effective crude oil costs would widen as well. If, however, supplies of $30 oil subsequently became more abundant, the price of refined products would drop to reflect an effective crude oil cost of only $30 per barrel less the entitlements subsidy, and the spread between refined products prices and average effective crude oil costs would narrow again.

The decontrol process

The current process of phasing out all crude oil price ceilings began in June 1979 and is scheduled for completion in October 1981. In the month before decontrol started, 83 percent of all domestic production was subject to price ceilings—34 percent lower tier and 49 percent upper tier (including Alaskan). During the phaseout period, lower tier is being gradually reclassified as upper tier while, simultaneously, upper tier is being gradually freed of price controls entirely. In addition, oil with a high sulfur content, newly discovered oil, and oil that is difficult and costly to recover are now free of price ceilings.[7] By the middle of 1980, the proportion of domestic output subject to price ceilings was down to 47 percent (15 percent lower tier and 32 percent upper tier). During the first year of decontrol, therefore, the proportion of total domestic output free of price controls rose from 17 percent to 53 percent.[8]

As crude oil price ceilings are eliminated, the released domestic oil receives a price comparable to foreign oil prices. Consequently, the value of the entitlements payments, which equalize average effective foreign and domestic crude oil costs, will fall automatically to zero as decontrol approaches completion. As the entitlements subsidy on imports disappears, the effective cost of crude oil going into United States refined products prices will rise to the price of imported oil.[9]

How much lower would effective crude oil costs and refined petroleum prices have been without decontrol? This depends on how large the import subsidy would have been had controls been continued. Suppose, for example, that the delivered price of imported oil, which was $34.48 per barrel in June 1980, reaches just $35 per barrel by October 1981. In this case, under plausible assumptions regarding the path of the continued controls mechanism, by October 1981 the import subsidy would have reached $8 per barrel, or 19 cents per gallon.[10] More plausibly perhaps, an October 1981 import price of $39 per barrel would result in an import subsidy of $10 per barrel (24 cents per gallon), while a $44 price would imply a $12 per barrel (29 cents per gallon) subsidy. Depending on foreign prices, therefore, by October 1981 the effective cost of crude oil going into United States refined products would be around 20 to 30 cents per gallon higher than without decontrol. Approximately the same figure

[7] For definitions of these new categories of uncontrolled oil, see United States Department of Energy, *Monthly Energy Review* (September 1980), pages 76, 96-97.

[8] Due to high transportation costs, however, the upper tier ceiling on Alaskan North Slope output (15 percent of the domestic total in May 1979) became an effective constraint on wellhead prices only after decontrol had already begun. This reflected the sharp rise in the world market price.

[9] The size of the entitlements subsidy can be expressed as the product of (a) an appropriately weighted sum of lower and upper tier oil as a fraction of all oil refined and (b) the difference between the average price of all imported and uncontrolled domestic oil eligible for the subsidy and the lower tier price ceiling. As price ceiling coverage is phased out, term (a) becomes zero, eliminating the subsidy. As noted earlier in this article, however, the rise in world prices during the first part of the decontrol process caused an increase in term (b) sufficient to produce a temporary rise in the subsidy. Without the phaseout of coverage, of course, this rise would have been larger (and not temporary).

[10] Without decontrol, the October 1981 category shares were projected as lower tier, 24 percent; upper tier (excluding Alaskan), 43.5 percent; Alaskan, 16 percent; and uncontrolled, 16.5 percent. Price ceilings and transportation costs were projected to rise at a 10 percent annual rate, and imports were projected to account for 45 percent of the crude oil used in the United States.

applies to refined petroleum prices.[11] Over the 29-month phaseout period (June 1979 through October 1981), therefore, decontrol will have added roughly a penny per month to United States petroleum prices.

The actual path of refined products prices since the start of decontrol has differed somewhat from the path of average effective crude oil costs, but this has been mainly due to the successive tightening and loosening of the world market during this period. The Iranian production cutoff at the beginning of 1979 sent spot market prices soaring. Some exporting nations raised prices considerably higher than others, and the price of uncontrolled domestic oil in the United States was bid above the average import price.[12] Thus, as crude oil prices from certain key sources rose considerably more than the overall average, the price of United States refined petroleum rose more than the average effective cost of crude oil from all sources together. The spread between refined products prices and average effective crude oil costs had already widened by June 1979 when decontrol began, but it continued to increase as the world market remained tight through early 1980 (Chart 1). By summer 1980, spot prices had fallen off and domestic uncontrolled oil had come back into line with average import prices, reflecting a loosening of the world market.[13] As a result, the spread between United States refined products prices and average effective crude oil costs narrowed again. During all this period, however, decontrol was making the import subsidy smaller than it otherwise would have been. This in turn raised the effective cost of crude oil from every source, thereby increasing United States refined petroleum prices above what they would have been without decontrol.

[11] In the very short run, any reduced usage of petroleum in response to higher prices may lower the profitability of refinery and distribution operations, reflecting competition for a smaller total amount of business. In the longer run, however, refining and marketing capacity will not be replaced unless the return on such investments justifies the capital costs. Ultimately, therefore, the final products prices will reflect the whole higher cost of crude oil plus the necessary capital and operating expenses of refining and distributing it.

[12] Late in 1978, Libyan and Algerian oils were priced about 10 percent above Saudi Arabian light crude oil, but by the middle of 1979 the price differential had widened to around 30 percent. See Department of Energy, *Weekly Petroleum Status Report* (August 1, 1980), page 39.

In December 1978 the average price, including transportation, of United States stripper oil was $14.57 per barrel, close to the average comparable import price of $14.92. By December 1979, however, stripper oil was selling for $33.43 per barrel, while the average price of imported oil was $28.91 per barrel.

[13] By July 1980 the average price, including transportation, of stripper oil was $34.45 per barrel, just under the average import price of $34.51.

The effect on imports

Even casual observation confirms that higher prices reduce United States petroleum use. After the first major oil price hike in 1973-74, the rate of growth of United States petroleum consumption slowed dramatically to 1.7 percent annually during 1973-78, compared with 4.7 percent over 1949-73. During 1978-80, total consumption declined at a 5 percent annual rate.[14] Moreover, the ratio of petroleum use to GNP was 17.2 percent lower in the first three quarters of 1980 than its 1973 level.[15]

These observations are supported by a statistical analysis of the relationship over time between United States petroleum prices and consumption. The results show that, holding GNP constant, a 10 percent rise in the wholesale price of United States petroleum products is on average associated with roughly a 2 percent fall in total usage.[16] For example, in the scenario described above with the price of imports reaching $39 per barrel by October 1981, the impact of decontrol on United States products prices (assuming a penny-for-penny pass-through of crude oil costs) is calculated as 24 cents per gallon, which amounts to a 28 percent rise at the wholesale level. This, in turn, should result in a fall of between 5.0 and 8.5 percent

[14] Total United States consumption is measured as deliveries of petroleum products from primary storage. The figure for 1978-80 is based on a comparison of the first nine months of 1978 and 1980. Sources: Department of Energy, Energy Information Administration, *Annual Report to Congress 1979*, Volume Two, page 43, and *Monthly Energy Review* (June 1980 and December 1980).

[15] The ratio of petroleum deliveries (thousands of barrels daily) to real GNP (billions of 1972 dollars) was 13.79 in 1973 and 11.42 over the first three quarters of 1980.

[16] Over the period 1975-I to 1980-II, an ordinary least squares regression was performed, with the following result:

$$C = 1.83 - 0.14P + 0.57Y + 0.41C(-1)$$
$$(2.1) \quad (3.2) \quad (2.7) \quad (2.0)$$
$$\bar{R}^2 = 0.86; \text{ D.W.} = 1.63; \text{ SEE} = 0.02$$

C is total petroleum consumption, P is a wholesale price index of refined petroleum products, deflated by the GNP implicit price deflator, and Y is real GNP, all in logarithmic form. The t statistics are in parentheses. The coefficients of the price and income variables are the respective short-run elasticities. The long-run price and income elasticities are −0.23 and 0.96, respectively, with 87 percent of the effect of movements in price and GNP on consumption occurring within two quarters and 95 percent within three quarters.

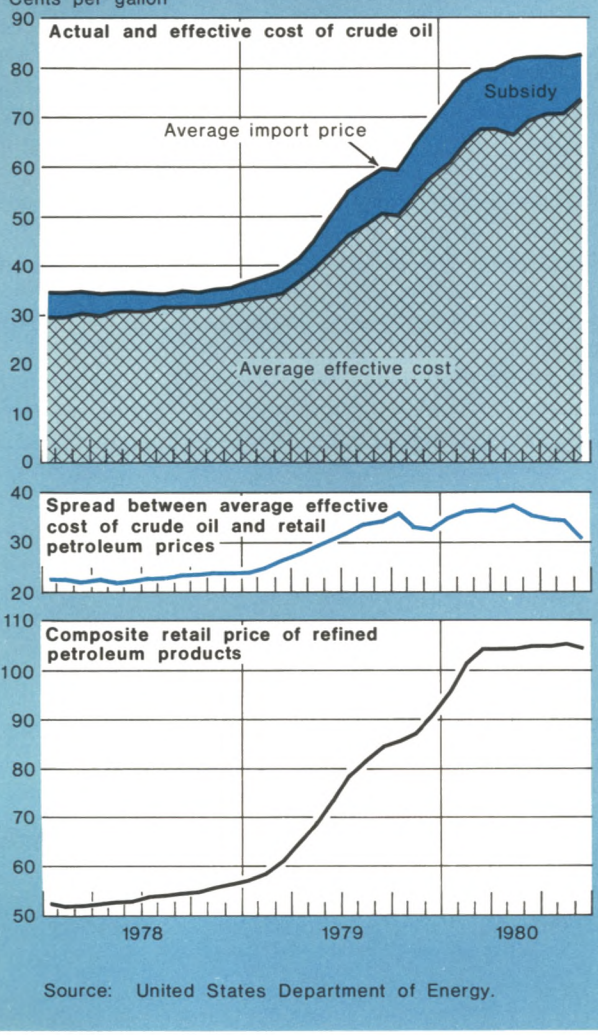
The lag structure is admittedly crude. Experimentation with alternatives failed to find a lag structure that was robust with respect to its specification. However, the total effect of price on consumption proved virtually unchanged under the alternative specifications.

An autocorrelation correction was performed to check for the possible bias in the D.W. statistic imposed by the presence of the lagged dependent variable, but this caused essentially no change in the coefficients.

A statistical appendix, containing sectorally disaggregated estimation results, as well as alternative estimation procedures, is available from the authors. The various methods yield similar results.

Chart 1

United States Crude Oil Costs and Refined Petroleum Prices



Source: United States Department of Energy.

in total United States consumption, or between 800,000 and 1.35 million barrels per day.[17]

The impact of decontrol on consumption, therefore, is to reduce imports of foreign oil by about 1 million barrels daily, equal to 18 percent of the level of imports in August 1980. This, moreover, understates the total effect on imports because United States petroleum output also depends on price. With newly discovered oil now allowed to receive an uncontrolled price, drilling activity has stepped up considerably.[18]

Effect on the consumer price index

The 24 cents per gallon increase in retail prices over the 29-month period of decontrol adds about 6 percentage points to the annualized rate of increase in the consumer fuel and power component of the consumer price index, using August 1980 as a base level. Since this component accounts for about one tenth of the total index, the impact of decontrol on the whole index is to add 0.6 percentage points to its annualized rate of increase between June 1979 and October 1981. Because this does not take into account the pass-through of higher energy costs into the prices of other consumer goods and services, the actual total impact may be somewhat greater.

Resistance to future foreign price hikes

Under controls, the import subsidy automatically rose along with foreign prices, offsetting roughly half of the impact of higher import prices on the effective cost of crude oil to refiners.[19] Without the subsidy, any future foreign price hike will result in a larger increase in United States refined petroleum prices and, therefore, in a greater reduction of oil imports. This makes it more difficult for exporters to raise prices unilaterally, since a given price rise would then require a bigger production cutback.

Suppose, for example, that the Organization of Petroleum Exporting Countries (OPEC) is considering two alternative strategies, one that increases prices by 10 percent and the other that raises prices 12 percent. For the sake of argument, also assume that the sensitivity of petroleum demand to price changes in the noncommunist world is about the same as it is in the United States. With total noncommunist world consumption at about 50 million barrels daily, of which 16 million is United States consumption, a 10 percent

[17] In August 1980, the approximate midpoint of the decontrol period, the composite wholesale refined products price was 86 cents per gallon and petroleum consumption averaged 15.8 million barrels per day. A 24 cents per gallon price increase implies a rise of 28 percent and, using the above elasticity estimate, results in a point estimate of about 1 million barrels per day. The range in the text allows for one standard deviation around the mean elasticity estimate.

[18] In the first eight months of 1980, 37 percent more oil wells were drilled in the United States than in the first eight months of 1979. See Department of Energy, *Monthly Energy Review* (October 1980), page 50.

[19] Under controls, with imported and uncontrolled domestic oil accounting for roughly half of refiners' crude oil inputs, a $2 rise in the imported (and uncontrolled) price would raise the overall average cost by $1. The import subsidy would rise about $1, and the average effective cost of imported oil would, therefore, be up only $1 on balance.

price increase would induce a 2 percent fall in consumption outside the United States, or 680,000 barrels daily. Due to price controls, however, United States consumption would fall only 1 percent, or 160,000 barrels daily. Thus, with United States price controls, OPEC would have to cut production by a total of 840,000 barrels daily in order to sustain the 10 percent price increase. Similarly, a 12 percent price rise would require an OPEC production cutback of 1 million barrels daily with United States price controls.

Without United States price controls, however, OPEC's price-raising options would not be so great. Without the import subsidy to mitigate the impact of price increases on United States petroleum users, cutting current production by 1 million barrels per day would sustain only the 10 percent price increase rather than the 12 percent rise possible before. More generally, with world petroleum demand rising because of economic growth, OPEC might even be able to sustain price hikes without cutting current output, but the price rise possible under each alternative production scenario will be smaller without United States controls.

Beyond decontrol

Crude oil price controls encouraged too high a level of petroleum consumption, discouraged domestic energy production, and increased oil imports. Although the full price of each barrel of imported oil is paid to the exporter, the subsidy makes the refined petroleum appear cheaper to the user. The user may be aware of economical ways to reduce consumption through alternatives costing less than the foreign oil. The controls program, however, reduces the incentives to pursue these alternatives, and potential savings go unexploited. If the true cost of foreign oil were no greater than its price, merely removing controls would rectify the problem, for then petroleum users would be motivated to pursue all the alternatives costing less than the unsubsidized price of oil.

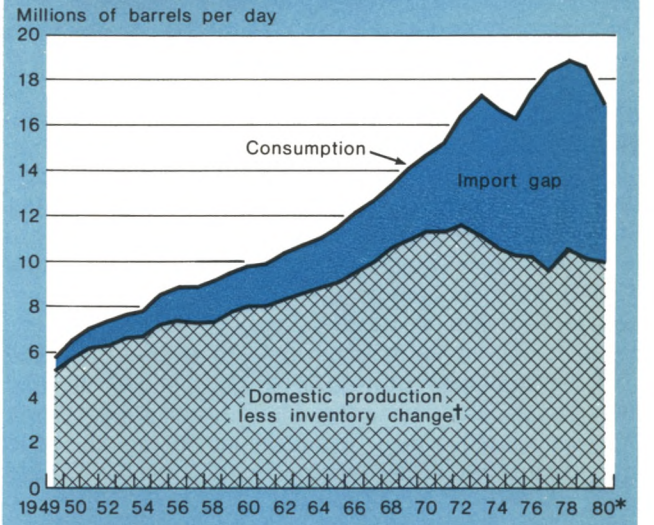
It is clear, however, that the true cost of foreign oil exceeds its dollar price. Most obviously, our dependence on imported petroleum leaves the country vulnerable to the threat of economic disruption.[20] In the 1970s, despite higher petroleum prices, United States dependence on imports rose dramatically as domestic oil production fell and consumption was boosted by the growth of the economy (Chart 2). Domestic oil price decontrol will augment the already ongoing response to higher imported oil prices in making United States industry, homes, and automobiles more fuel efficient. Nevertheless, the United States has become so dependent on foreign oil that it will require a strong, sustained initiative to resolve the long-run problem meaningfully. Effective new policies will be needed to make possible both sustained economic growth and substantial progress in reducing oil imports.

A logical and desirable extension of crude oil price decontrol would be a tax to discourage imports. This could take the form of an added tax on gasoline consumption, an oil import fee, or many other possibilities. The basic idea is to raise the effective cost (including the tax) of petroleum to a level that more correctly reflects the true cost of importing foreign oil. This would further lower our imports; the higher the tax, the less foreign oil we would use. Such a tax could then offset other government revenue sources and thus would not require a net rise in overall taxes.

In Europe, gasoline is subject to much higher taxes

Chart 2

United States Petroleum Production and Consumption



*Preliminary for 1980.

†Domestic production includes crude oil, natural gas plant liquids, processing gain, unaccounted-for crude oil, and other hydrocarbons.

Source: United States Department of Energy.

[20] In addition, the more we reduce United States oil consumption (which accounts for nearly 30 percent of world oil output) the more slack this allows in the world market, making it increasingly difficult for exporters to maintain or raise their prices. Even if reducing United States oil consumption initially costs more than the dollar price of the oil, the subsequent effect on import prices would make it worthwhile since the cost of the remaining oil imports would then be lower than otherwise.

than in the United States. As of July 1980, the tax on a gallon of gasoline was $2.16 in Italy, $1.68 in France, $1.23 in West Germany, and $1.19 in Great Britain. in the United States the average tax in May 1980 was only 14 cents per gallon. Suppose, for example, that an additional one dollar per gallon tax on gasoline in the United States were imposed at the expiration of controls in October 1981. A rough estimate is that this would induce a fall of 12 to 14 percent in United States gasoline consumption.[21] This would amount to a reduction of demand between 785,000 and 910,000 barrels per day, which is 11 to 13 percent of current United States petroleum imports.

An alternative would be to limit petroleum imports directly with an import quota.[22] With the petroleum available to the domestic market restricted, the license to import petroleum would take on value. The costs associated with securing the import license then would be added to the imported oil price, raising the total effective cost of petroleum on the domestic market, just as a tax would. In this respect, direct limits on imports would be similar to a tax on petroleum.

In another important respect, however, direct quotas would be much worse since they would seriously undermine our resistance to future foreign price increases. If exporters raised their price, a petroleum tax would maintain the desired gap between the import price and the effective cost of petroleum on the domestic market, and imports would fall. Under a quota system, however, imports are essentially predetermined. A foreign price increase would simply reduce the value of the import licenses. Unless the quota could be automatically adjusted downward whenever oil prices were raised, the foreign price hike would be, in a sense, completely subsidized, leaving domestic petroleum prices unaffected.[23] With United States consumers' responses eliminated, the sustainable price rise associated with each alternative production scenario of exporting nations would be greater.

[21] Price and income elasticities for gasoline demand were estimated as −0.27 and 0.68, respectively (see the statistical appendix, available from the authors), implying a level of gasoline consumption in 1981-III of 6.4 million barrels per day. The range reported in the text allows one standard deviation from the mean in the price elasticity.

[22] This analysis of import quotas also generally applies to schemes for directly rationing petroleum among final users, with the cost of rationing coupons analogous to the cost of import licenses.

Conclusion

Decontrol is clearly a step in the right direction, but once that is completed new initiatives to reduce oil imports will be required. Replacing the current subsidy on oil imports with higher taxes on petroleum would help move the United States toward this goal. Unlike quotas, higher petroleum taxes would retain the United States increased resistance to future foreign price hikes. Furthermore, revenues from the petroleum tax would stay in the country and could replace other sources of funding for government. Only by continuing decontrol's serious initiative against imported oil can the United States realistically pursue both economic growth and less dependence on foreign oil.

[23] If foreign oil prices rose so much that the quotas became irrelevant, then from that point on price increases would no longer be subsidized.

Paul Bennett, Harold Cole, Steven Dym

Social Security and Savings Behavior

Among the most important issues facing the United States economy today is whether existing public policy discourages saving. A central aspect of the problem of insufficient saving and capital formation is the role of the social security system. Many people believe that the United States social security system serves to depress the level of saving in the economy. They point out that a major motivation for saving by individuals is to provide income for retirement. If the need for such saving is reduced because of the existence of Government-sponsored transfers of income to the elderly, then the level of saving may be reduced as well.

The proposition is indeed disturbing because it implies that growth of the social security system may result in reduced levels of saving and capital formation and, as a consequence, lower productivity growth and real output growth. Clearly, if these trade-offs exist, the social security system needs to be reexamined. However, it is first necessary to evaluate the logic and evidence underlying the proposition. As it turns out, its veracity is not self-evident on either grounds. The effect of social security on saving involves a diverse and complex set of issues, of which retirement saving is only one. Consequently, the popularity of the proposition that the social security system depresses saving is not justified.

The author is a professor of economics at New York University Graduate School of Business Administration. This article was written while he was a visiting economist at the Federal Reserve Bank New York. The views expressed do not necessarily reflect those of the Federal Reserve Bank of New York.

In addition to private retirement saving, the social security system can affect a broad range of household decisions. Thus, its effects on savings behavior remain ambiguous. In particular, social security may affect retirement decisions by inducing earlier retirement, in which case saving during working years may be increased. Additionally, social security interacts with a whole variety of household investment decisions, such as those involving human capital—schooling, job training, health, etc. In this context, social security, which reduces the need for retirement saving, may lead to a shift in the composition of saving toward human capital investments. Any apparent negative effect of social security on saving, then, may be because broad areas of capital formation are omitted from measured saving. A related issue, which also implies that social security has a potentially ambiguous effect on saving, is the way in which social security affects the level of intergenerational transfer payments, such as gifts and bequests to children by parents and support to elderly parents by their adult children.

Finally, even if the hypothesis that social security reduces savings incentives is true, it is important to consider fully the effects on society of any changes in the social security system. The usually suggested remedy for the savings offset of the existing social security system is to reduce benefits or to increase social security taxes. Both of these could have profound effects on the level of economic activity and the distribution of income. In the light of these broad consequences, it is not clear that the suggested changes in the system are warranted.

The social-security-depresses-saving proposition

The argument why social security substitutes for private saving is deceptively simple. It is best explained by examining the lifetime patterns of households' consumption and saving. Typically, individuals' earnings increase with work experience and then decline at retirement. By saving during the most productive years and dissaving during retirement, individuals can maintain a smooth pattern of consumption over their lifetime.[1] If income increases with age until retirement, while consumption is relatively constant, then there are periods of dissaving early in life and after retirement and a period of saving during mid-life.

With such a lifetime allocation, consumption depends on total wealth or command over resources rather than being constrained by income at any particular time. In this context, the concept of wealth is a broad one. In addition to net financial assets and physical assets, wealth includes the present values of future earnings and of benefits to be received from the social security system. These latter items are the value today of earnings or benefits to be received in the future. They are included in wealth because they are part of the individual's lifetime command over economic resources. When social security benefits are increased, every individual's overall wealth or lifetime command over resources also increases. As a result, the typical individual will raise the current level of consumption. Thus, an increase in social security benefits is an increase in wealth which can lead the typical household to reduce the proportion of current income that is saved.

The relationship is not, however, quite so simple. It is complicated by the existence of social security taxes, by the effect of social security on retirement decisions, by the role of intergenerational transfer payments, and by the interaction of social security with human capital investment decisions. An examination of these issues reveals that an increase in social security benefits can cause either an increase or a decrease in personal saving. Ultimately, the question of whether social security reduces saving must be settled by empirical investigation. However, the existing empirical evidence does not address all the issues raised.

Social security taxes

The role of social security taxes will be examined first. If the social security system were fully funded, which means that the present value liabilities of the system are offset exactly by its assets, an increase in future retirement benefits would be matched by an equivalent increase in lifetime tax liabilities. The typical individual pays taxes that accumulate in a social security fund. At retirement, this fund is just large enough to pay out retirement benefits over the expected remaining lifetime. In the case of such a fully funded system, the individual's wealth and therefore savings behavior would be unaffected by a benefit change. This is because a benefit increase which adds to wealth would be offset by wealth-reducing increases in taxes.[2]

Although the social security system as originally envisioned was a fully funded system, this is no longer the case. Generally speaking, social security taxes are set at a level sufficient to pay for current benefits. Since both the size of the population and labor productivity are growing, taxes levied to provide current benefits are less than the present value of future benefits. Thus, expansion in benefits has increased the net social security wealth held by those currently alive. The opposite effect can occur, if the retired population is large relative to the working population or if benefits accrue to nonearners. It is then possible that an expansion in the benefit structure can require tax increases for current workers, which are more than equivalent to the increase in their expected benefits. Changes in the age structure of the population after the year 2000 are likely to bring such a situation about, since the number of retirees will be approaching the size of the working population.

Retirement decisions

Social security can also affect the decision to work. The current system provides strong inducement to retire at age 65 because retirement benefits are reduced by about 50 cents for every dollar earned over a certain ceiling for those under age 72. Thus, the social security system induces people to retire earlier. To take advantage of the benefit structure, individuals may accumulate additional assets during their working years to provide more retirement income. With a shorter working life, and the prospect of only partial earnings replacement from social security, wage earners may increase their pre-retirement saving.

Thus, for the typical worker, an increase in the social security benefit structure has a wealth effect which reduces saving and a retirement effect which increases

[1] In the economics literature, this approach is known as the life-cycle theory of consumption. For a more complete development see, for example, Rudiger Dornbusch and Stanley Fischer, *Macroeconomics* (New York: McGraw-Hill, Inc., 1978), pages 146-54.

[2] This argument also relies upon some additional rather heroic assumptions, often favored by economists but hardly likely to be true. For example, the rate at which individuals discount future benefits must be equal to the rate of return on saving. In a complex world where taxes and financial market imperfections intervene, individuals may not be indifferent to present taxes as opposed to equivalent future benefits.

saving. However, it is unlikely that the additional saving due to induced earlier retirement would be as large as the saving replaced by the social security system. This is because social security benefits are likely to be received for a number of years, while retirement is likely to be only a few years earlier than it would be in the absence of social security. Thus, the value of benefits will be larger than the additional saving needed for earlier retirement. This comparison assumes that individuals have a clear perception of the magnitude of the increase in wealth due to changes in social security benefits. Such an assumption is unwarranted as the benefits to be received by an individual are not known with certainty; they depend on his or her earnings and length of life. Thus, the effect of social security on the age of retirement can have important implications for savings behavior.

The induced retirement effect of the social security system has an ambiguous effect on aggregate saving for an additional reason. The retirement effect would change the savings behavior of workers and also increase the relative size of the nonworking population. The total effect on the income and saving of the entire population has not been explored.

Intergenerational transfers

The discussion of lifetime planning of consumption patterns did not refer to bequests or to private intergenerational transfers of income. These phenomena are widely observed in the real world, and the latter one is of particular concern. Intergenerational transfers of income may well be an important means of providing for retirement. Thus, Government provision of retirement income through the social security system may substitute for private intergenerational income transfers rather than substituting for the intragenerational deferral of consumption (retirement saving).[3] To be specific, a situation can be envisioned where, in the absence of social security, elderly persons are provided for by income transfers from their working children. With a social security system, the working children make tax payments instead of direct transfers and retirement income for the parents is provided by the Government. It is conceivable that the two systems are equivalent and the disposable income and saving of both parents and children are the same in each case.

[3] This idea has been emphasized by Robert Barro, "Are Government Bonds Net Wealth?", *Journal of Political Economy* (November/December 1974), pages 1095-1118. However, aggregate social security benefits are so large that it is difficult to imagine that, in the absence of social security, private transfers would approach the same magnitude.

This is an important possibility because it suggests that social security has displaced private transfers rather than private saving and capital formation. The consequences for saving of such an income redistribution have not been adequately explored but are probably less severe than the wealth effects indicated by the life-cycle approach.

Along these lines, it is interesting to note that the social security system may have widespread influences on the living patterns of the elderly and the relationship between the generations. For example, social security may encourage the elderly to live alone rather than to share living arrangements with the young. Alternatively, social security may be viewed as a social response to these changes in mores.

Social security and human capital

The final complication to the basic life-cycle proposition that social security offsets private saving involves an important element of household savings decisions and lifetime planning that is by and large overlooked in discussions of the social security system. That is, the interaction between social security and capital formation in the form of human capital investments.[4] Introducing human capital, particularly investments in education, adds a degree of complexity that has not been explored. This is a serious omission since it is possible that the interaction of human capital investments with social security is strong.

The strength of the relationship is suggested by the similarities between human capital wealth and social security wealth. Both are nonfungible assets, unlike the financial and physical assets which are viewed as social security substitutes in existing empirical studies. Thus, it is possible that the relationship between these types of assets is as important as their relationship to the standard forms of saving. Additional similarities are that human capital investments, along with retirement saving, are an important form of life-cycle planning by the family unit and, also, that human capital investments are an important form of intergenerational transfers.

It is not evident whether social security wealth and human capital investments should be viewed as substitute or complementary assets. In the first case, social security which provides retirement income could be viewed as an alternative to educating one's children so that they will have the income to provide retirement support to their parents. This does not seem to be the appropriate argument because the tendency

[4] Sherwin Rosen suggests the possibility of a relationship in "Social Security and the Economy", *The Crisis in Social Security* (San Francisco, California: Institution for Contemporary Studies, 1977).

to invest in human capital has increased a great deal since the inception of social security. It is more likely that social security wealth and human capital are complementary assets. In this case, the advent of the social security system, which reduced the burden of saving for retirement, made it possible for the typical individual to devote more resources to saving in the form of human capital.[5]

Although these hypotheses have not been tested, perhaps an effect of the social security system has been to induce the household sector to channel its resources into human capital investments. Thus, by standard measures, saving did decline, although, due to increases in human capital investments, overall capital formation need not have declined. This argument does not obviate the entire issue, if policymakers feel that the induced move from physical to human capital formation has been excessive.

There is yet another interrelation between social security and human capital investments. An individual can provide for retirement by accumulating ordinary assets over his working life or by investing in education with the hope that the returns to human capital investment will provide retirement income. As the returns to human capital investments are highly variable among individuals, there may well be a preference for a less risky means of lifetime planning. Since social security reduces the risk of being without income in one's old age, it may encourage individuals to make investments in human capital.

Because of the unavailability of data, there have not been any empirical studies of the relationship of social security to both private intergenerational transfers and investments in human capital. Although there is some evidence indicating that financial support from children to parents is relatively small, it is not clear whether this is a consequence of social security. Data on intergenerational transfers of human capital and the relationship between human capital and other forms of wealth are almost totally lacking.

Social security policy

If the proposition that social security depresses saving is in fact true, then some changes in social security policy would be appropriate.[6] Supporters of the proposition have suggested changes in the way in which the system is financed. However, such modifications would have additional undesirable effects on the economy. In general terms, the overall issue is whether the system should be one of intergenerational transfers, essentially pay as you go, or whether it should be a fully funded annuity system.

As the social security system grew, it evolved into a pay-as-you-go system. The trust fund of Government securities, which accumulated in the early years when there were few beneficiaries relative to workers subject to the payroll tax, eroded as the Congress increased benefits. An error made when the 1972 Social Security Act was drafted, compounded the problem by double-indexing the benefit structure.[7] Without large increases in payroll taxes, the trust fund was well on its way to bankruptcy. This was rectified by the amendments legislated in 1977 which put social security back on a sound pay-as-you-go system.[8]

Changes in the demographic structure of population over the next fifty years will still put serious financing strains on the system. After the year 2000, there will be a substantial growth of the population above retirement age relative to the working-age population. The number of persons retired as a percentage of the working population will increase from the present level of about 19 percent to about 30 percent in 2030. The increase will not start until after 2000 and will be even larger if fertility continues at its present low level. Thus, there is a long-term problem of an increasing burden on financing social security pensions, even though the amendments in 1977 reduced the immediate crisis by stopping the growth of the so-called replacement rate. The replacement rate—the ratio of the median pension benefit at retirement to the median wage prior to retirement—had increased from about 0.3 to over 0.4 in the 1970s because of the indexing procedures. The current legislation will maintain the rate at a constant level of about 0.42. If it had continued to increase, much larger increases in the payroll tax would have been necessary.

Proponents of the social-security-retards-private-capital-formation proposition argue that the system

[5] An elaboration of this argument is found in "Social Security and Investment in Human Capital" by Thomas F. Pogue and L.G. Sgontz, *National Tax Journal* (June 1977), pages 157-70. They also present some empirical evidence that the advent of social security has increased human capital investments.

[6] For a complete review of all the policy issues, see Bruno Stein, *Social Security and Pensions In Transition* (New York: Free Press, 1980).

[7] The problem arose from linking both benefits paid and the wage base used to determine initial benefits to changes in consumer prices.

[8] The system is still not without its financial problems. There is considerable pressure in the Congress to roll back the scheduled increases in the payroll tax rate. In addition, continued high inflation could create a cash flow problem for the trust funds by the mid-1980s. In either case, short-run financing from general revenues may be necessary. For a historical analysis of the social security system, see Martha Dethrick, *Policy Making for Social Security* (Washington, D.C.: The Brookings Institution, 1979) and Rita Campbell, *Social Security Promise and Reality* (Stanford, California: Hoover Institution Press, Stanford University, 1977).

should pay pensions from an actuarially appropriate trust fund, rather than on a pay-as-you-go basis. In this case, social security wealth would not be fictional but instead would be backed by existing assets. Such a proposal would require substantial tax increases for the fund to accumulate sufficient assets. In essence, there would have to be a larger Government surplus on the consolidated budget as the trust fund accumulated outstanding Government debt. The idea behind this is that it would release funds to the private capital markets. However, the effect of such tax increases, in the short run, on aggregate demand and output could be devastating. A basic lesson of Keynesian macroeconomics is that, although a surplus reduces government demands on the capital market, it can induce a recession and lower the overall private-sector demand for capital goods. These latter caveats are understood by the proponents of the trust fund approach who argue that social security should move toward a funded system gradually, as short-term macroeconomic policy permits.

The idea that social security should be funded can be criticized on additional grounds best explained by describing the development of the system.[9] When the social security system began, the initial generation of beneficiaries received a considerable net transfer since their benefits exceeded their payments. If the argument is that this reduced their saving, then the current generation is producing with a deficiency in the capital stock. By increasing taxes and further decreasing the standard of living of the current generation, we may in the long run be able to accumulate a fund and also make up the capital deficiency. This transition may take several generations but, from then on, the system will be funded in the sense that each generation's benefits are the taxes it accumulated plus interest. Such a proposal imposes the burden of reducing consumption to accumulate a fund on the current generation. This was not viewed as desirable forty years ago when the system conferred benefits on the initial generation and does not seem any more appropriate now.

If the current capital stock is considered deficient, there are many other policy approaches to influencing the level of investment, including reduced taxation of capital income. If there is concern about making the overall tax structure less progressive, it hardly seems appropriate to use payroll tax increases to influence capital formation. There is no specific reason why a society has to make up any capital stock deficiency that developed when intergenerational transfers were introduced. It is instead a question of equity and fairness in the design of an overall tax system. Clearly, changes in the distribution of the tax burden promote capital formation, but a society with a concept of distributional equity might not make such choices.

Perhaps the most telling blow to the proposal of funding is its impracticality. At current benefit levels and interest rates, the fund would have to approach $1,000 billion, more than the total privately held public debt. Even a gradual fund accumulation would require large changes in the tax structure, with distributional consequences that are not likely to appeal to the public or political decision-making bodies. The current generation is not likely to volunteer to reduce its living standard substantially in order to enlarge the productive capital stock for its heirs. Rather than dwelling upon the relative merits of a pay-as-you-go or funded transfer system, perhaps society should address the issues concerning taxation and capital formation directly.

Review of the evidence

One of the most problematic aspects of the hypothesis that social security curtails saving and capital formation is that casual observation of structural developments in the economy since the inception of the social security system provides scant evidence of any such effect. In a sense, the legislation created vast sums of wealth in the economy while the physical assets in the country were unchanged. Over time, one would expect major adjustments in the structure of the economy in response to these changes. If there has been an effect on saving, researchers should also be able to detect the effect on capital intensity and on the rates of return to capital. For example, the creation of social security wealth makes physical assets relatively scarce which should lead to larger returns on such assets. Similarly, if social security displaces saving, some downward secular trend in rates of saving and capital formation should have emerged. However, economists have not observed either phenomenon.[10] It would be difficult to argue that savings rates have been remarkably steady because increased real returns have offset the depressing effects of social security. Most economists have argued that, if anything, real returns to

[9] The line of argument that follows draws upon the discussion by Mordecai Kurz and Marcy Arvin in "Social Security and Capital Formation: The Funding Controversy", *Working Papers* of the President's Commission on Pension Policy, 1979.

[10] There is evidence that the rate of return to schooling, a major component of human capital investments, increased for many years and declined in recent years. This could support the interaction between social security and human capital suggested earlier.

capital have declined in the postwar period.[11]

More formal tests of the proposition that social security depresses saving have been conducted, largely in the context of the life-cycle approach, discussed earlier, which showed that wealth is a key determinant of consumption. Econometricians attempt to measure the impact of social security on saving and consumption by specifying an equation that relates consumption expenditure to social security wealth. Social security is a savings depressant if the estimated impact of social security wealth on consumption is positive and can be statistically distinguished from a zero effect. A brief description of the results follows. A fuller, but still nontechnical, summary is presented in the accompanying appendix.

Current interest in the effect of social security on saving was sparked by Martin Feldstein's 1974 econometric study.[12] His conclusion that there is a very strong depressing effect has been the basis for all discussion and argument since then. However, an attempt by Dean R. Leimer and Selig D. Lesnoy of the Social Security Administration to replicate his data uncovered a data error.[13] When the social security wealth variable is corrected, the results are strikingly different. Feldstein's conclusion that social security has reduced personal saving by one half and the stock of capital by one third is completely unsubstantiated with the corrected data. This is important because the enormous depressing effect on saving has been widely quoted and supported by many economists for six years.

Empirical studies have also attempted to measure the effect on labor supply and retirement decisions. Social security may affect saving because it provides an incentive for retirement. The advent of social security makes much of the working public plan for retirement by increasing their saving during working years. Alicia Munnell's tests of this hypothesis found that the sizable decline in the labor force participation rate for men aged 65 and over (from just under 50 percent when social security was introduced to less than 25 percent by the mid-1970s) had a substantial positive effect on saving. Even if this entire increase were attributed to social security, the induced increase in saving would offset only about one half of the reduction of saving due to social security wealth.[14]

Clearly, it is difficult to make definite judgments based on aggregate savings data. Since economists do not conduct controlled experiments, it may not be possible to determine what the world would be like without the social security system. The historical comparison of the present economy with the depression era may be inadequate for isolating the effect of the creation of the social security system from all the other changes in the structure of the economy over the past forty years.

There are two other types of data which also can be used to investigate the effects of the social security system on saving: data on the savings behavior of different individuals (cross-section data) and data on the savings behavior in different countries.

Cross-section data have been used to investigate the effect of differences among individuals in private pension plans and social security benefits and taxes on savings behavior. The evidence concerning the wealth effect of social security on saving is weak.[15] Lawrence Kotlikoff suggests that the savings offset predicted by theory is not found in the data because individuals are unable to forecast their social security benefits and their age of retirement. Others argue that reduced intergenerational transfers and induced retirement effects of social security are unlikely to offset the negative effect of social security on wealth accumulation. However, even the cross-section results, indicating that individuals with relatively higher social security save less, do not necessarily imply that, after aggregation over the entire population, an increase in the scale of the social security program reduces total saving.

Another path of empirical investigation examines differences in both savings behavior and social security systems among countries. Virtually all industrialized nations have some form of government-sponsored program for transfers to the elderly. Since the cross-national differences in savings behavior are large, some analysts have asked whether these differences in savings behavior are to any extent due to differences in social security benefits. Most recently, Robert

[11] It should also be noted that social security is only one type of fictional wealth. Social security wealth—the present value of future benefits—is fictional because it is not matched either by future contributions or by the expected earnings from existing assets. The vast unfunded liabilities of private (for some large corporations such liabilities exceed net worth) and government (civil service, military, etc.) pension systems are also forms of fictional wealth. Even more than social security, these wealth components have grown very rapidly in recent years, without any obvious effect on aggregate saving.

[12] "Social Security, Induced Retirement, and Aggregate Capital Accumulation", *Journal of Political Economy* (September/October 1974), pages 905-26.

[13] Their results were presented to the annual meeting of the American Economic Association in Denver, September 5-7, 1980. For a report, see "Economic Diary", *Business Week* (September 22, 1980).

[14] In the Munnell study, "The Effect of Social Security on Personal Savings" (Cambridge, Massachusetts: Ballinger Publishing Co., 1974), the income coefficient in the consumption relation depended on the labor force participation rate for men aged 65 and over.

[15] For example, see the studies by Lawrence Kotlikoff, "Testing the Theory of Social Security and Life Cycle Accumulation", *American Economic Review* (June 1979), pages 396-410, and by Martin Feldstein and Anthony Pellechio, "Social Security and Household Wealth Accumulation, New Microeconomic Evidence", *The Review of Economics and Statistics* (August 1979), pages 361-68.

Barro and Glen McDonald examined the effect of international differences in the ratio of real social security benefits per person over 65 to real income per capita on savings rates.[16] They conclude that available cross-national data are not rich enough to allow any inferences about the effect of social security on saving.

At this juncture, it is useful to draw some conclusions concerning the empirical evidence on the effect of social security on savings behavior. One can only say that there is some highly tentative empirical support for the hypothesis that social security substitutes for private retirement saving. Since private retirement saving represents wealth accumulation which results in capital formation, while unfunded social security programs are backed only by the accumulation of "fictional" wealth, it is possible that overall capital formation is depressed. However, there is a complex set of other effects of social security which makes it impossible to give unqualified support to this hypothesis. These effects that the empirical literature has been unable to isolate adequately include retirement decisions, the private provision of pensions, other forms of intergenerational transfers, and other types of capital formation.

Conclusions

Although this discussion of social security involves a complex and diverse set of issues, two threads do seem to emerge.

Social security should not, at this juncture, be viewed as a substitute for private retirement saving. The issue is an empirical one, and the existing evidence offers only some tentative statistical support for the hypothesis. Furthermore, the evidence is deficient because it omits any serious consideration of the complex relationships between social security and other forms of intergenerational transfers, such as human capital investments.

The unfunded, or pay-as-you-go, public transfer system should not be viewed as the culprit that has caused a lower than desired capital stock and lagging productivity growth. Social security is just one part of an overall system of public expenditure and income redistribution that interacts with private savings decisions in many ways. The desirability of inducing more capital formation is a broad policy issue that should be dealt with in a larger framework, particularly since the extent of any capital formation effect of social security is, as yet, uncertain.

[16] "Social Security and Consumer Spending in an International Cross Section", *Journal of Public Economics* (August 1979), pages 275-89.

Paul Wachtel

Appendix: The Effect of Social Security on Saving

There have been several empirical studies of the effect of social security on saving which fail to reach any consensus. A thorough technical survey of these studies was made, one by Louis Esposito, "Effect of Social Security on Saving: Review of Studies Using United States Time Series Data", *Social Security Bulletin* (May 1978), pages 9-17, and one by N. Bulent Gultekin and Dennis Logue, "Social Security and Personal Saving: Survey and New Evidence", *Social Security versus Private Saving*, George M. von Furstenberg, ed. (Cambridge, Massachusetts: Ballinger Publishing Co., 1980). A brief, nontechnical summary of the methodology, results, and sources of the disagreement is presented here.

There is broad agreement among economists about the general specification of a life-cycle consumption function estimated from time series data. Typically, it takes the following form:

$$C_t = \alpha_0 + \alpha_1 YD_t + \alpha_2 YD_{t-1} + \alpha_3 W_t + \alpha_4 SSW_t + \mu_t$$

where:

C = real per capita consumption expenditures,
YD = real per capita disposable personal income,
W = real per capita personal sector net worth,
SSW = real per capita social security wealth, and
μ_t = residual or error term.

The parameter estimates enable the econometrician to predict the effect on consumption (and hence on saving) of the variables on the right-hand side of the equation. For the question being considered—the effect of social security on saving—the coefficient on the SSW variable defined in the text is of crucial interest. The econometric literature includes many variations on this equation, and there is some controversy concerning which, if any, additional explanatory variables should be included in the consumption relationship. This is important because the coefficient of SSW is sensitive to the inclusion of other variables, such as the unemployment rate, and to changes in the time period of historical data used for estimation.

Important for evaluating the magnitude of any particular coefficient is the concept of statistical significance. Without providing a technical explanation, a coefficient is statistically significant if the results provide reasonably substantial evidence that the estimated coefficient differs from zero. Changes in the specification of an equation can affect both the magnitude of the coefficients, as stated above, as well as their statistical significance. In our context, social security is a savings depressant if the coefficient on SSW is positive (*i.e.*, increases in SSW raise consumption) and significantly different from zero.

August-October 1980 Interim Report
(This report was released to the Congress and to the press on December 3, 1980.)

Treasury and Federal Reserve Foreign Exchange Operations

Coming into the August-October period under review, exchange market participants remained cautious about the outlook for the dollar. Traders were encouraged by the improving trend in the United States current account, which had swung from deep deficit to near balance and was expected to move into surplus by late 1980. At the same time, however, they were concerned about the outlook for inflation in the United States. Even though our price indexes were no longer rising as rapidly as before, inflation remained uncomfortably high by historical standards and by comparison with inflation rates in many other industrial countries. Moreover, it was feared that the improvements in our current account and price performance might prove transitory to the extent that they stemmed from the sharp recession which had emerged in the United States earlier in 1980. Meanwhile, discussion of possible tax cuts or of an easing of monetary policy had generated concern in the market that heavy stimulus to the economy might undercut the anti-inflation effort. For its part, the Federal Reserve had phased out the special credit restraints imposed in March, but Chairman Volcker had made it clear that the Federal Reserve would continue to adhere to its efforts to slow the growth of money and credit in the United States by placing primary emphasis on bank reserves rather than on interest rates.

A report by Scott E. Pardee. Mr. Pardee is Senior Vice President in the Foreign Department of the Federal Reserve Bank of New York and Manager of Foreign Operations for the System Open Market Account.

By August, United States interest rates were rebounding from their latest lows, and a sudden surge in the growth of the monetary aggregates gave rise to some expectations that United States interest rates might advance even further.

Meanwhile, the market's uncertainties were not limited to the outlook for the dollar. Most other major industrial countries were afflicted with inflation rates which were too high by their own standards and by substantial current account deficits which had been aggravated by the oil price increases of 1979 and early 1980. The authorities had pursued restrictive policies to deal with these problems. By late summer, economic growth was slackening generally, prompting the authorities in several countries to move cautiously toward a less restrictive policy stance. But they were reluctant to move too quickly in the direction of ease in view of the need to fight inflation and their efforts to keep interest rates sufficiently high to attract funds from abroad to finance large current account deficits. As a result, interest rates remained high even as market expectations built up that, in view of domestic economic considerations, an easing of monetary policy was imminent in several countries.

Consequently, an uneasy atmosphere persisted in the exchange markets through August and early September as traders sought to assess the implications of these economic and financial developments here and abroad. In addition, the sense of unease was heightened from time to time by political events, such as general strikes in Poland and continued tensions

in the Middle East. In this environment, exchange rates fluctuated widely day to day but few clear trends developed, with the exception that both sterling and the Japanese yen were bid up by force of heavy capital inflows. Among the currencies participating in the joint float arrangement, the French franc remained near the top of the band and the German mark near the bottom.

In the absence of renewed selling pressures on the dollar, the United States authorities took the opportunity to acquire currencies to repay debt arising from earlier intervention and to rebuild balances. Operating on days in which the dollar was firm or rising, the United States authorities bought a total of $426.6 million equivalent of German marks in the market, either in New York or in Frankfurt through the agency of the Bundesbank. Over the same period, the Trading Desk purchased an additional $453.6 million of marks from correspondents. The Federal Reserve used a portion of these marks, along with previously acquired balances, to repay swap debt to the Bundesbank, which was reduced from $879.7 million at end-July to $362.6 million on September 15. The remaining acquisitions were added to Treasury balances which increased by $338.1 million equivalent. The Federal Reserve also bought small amounts of French francs and Swiss francs in the market and from correspondents. On occasions when the dollar came under selling pressure in August, the United States authorities intervened on five different days, selling a total of $69.6 million equivalent of marks, including $53.9 million equivalent from Federal Reserve balances and $15.7 million from United States Treasury balances.

By mid-September, economic indications suggested that the United States was moving out of recession. Although the upturn was welcomed by the markets, it dimmed the prospects for further inflation relief in the near term. Indeed, partly because of rising food prices, the United States inflation rate was expected to accelerate. Moreover, the money and credit aggregates were growing rapidly. In response to this buildup in the demand for money, the Federal Reserve was acting to constrain the growth of bank reserves. Market interest rates climbed sharply, and on September 26 the Federal Reserve raised the discount rate by 1 percentage point to 11 percent. Strong demand for money and credit persisted through October, putting additional upward pressure on money market rates.

This advance of United States interest rates was not matched abroad, where, if anything, the authorities were becoming increasingly concerned about slower economic growth and the prospect of recession. Consequently, interest differentials swung increasingly in favor of the dollar against most major currencies,

Table 1

Federal Reserve System Drawings and Repayments under Reciprocal Currency Arrangements

In millions of dollars equivalent; drawings (+) or repayments (−)

Transactions with	System swap commitments July 31, 1980	August through October 31, 1980	System swap commitments October 31, 1980
Bank of France	166.3	− 165.2*	-0-
German Federal Bank	879.7	− 873.0*	-0-
Total	1,046.0	−1,038.2*	-0-

Because of rounding, figures may not add to totals.
Data are on a transaction-date basis.

* Repayments include revaluation adjustments from swap renewals, amounting to $1.1 million for drawings on the Bank of France and $6.7 million for drawings on the German Federal Bank which were renewed during the period.

Table 2

United States Treasury Securities, Foreign Currency Denominated

In millions of dollars equivalent; issues (+) or redemptions (−)

Issues	Amount of commitments July 31, 1980	August through October 31, 1980	Amount of commitments October 31, 1980
Public Series			
Germany	5,233.6	-0-	5,233.6
Switzerland	1,203.0	-0-	1,203.0
Total	6,436.6	-0-	6,436.6

Data are on a value-date basis.

Table 3

Net Profits (+) and Losses (−) on United States Treasury and Federal Reserve Current Foreign Exchange Operations

In millions of dollars

Period	Federal Reserve	United States Treasury: Exchange Stabilization Fund	United States Treasury: General account
August 1, through October 31, 1980	+14.0	+ 0.1	-0-
Valuation profits and losses on outstanding assets and liabilities as of October 31,1980	+12.7	−372.8	+138.8

Data are on a value-date basis.

prompting flows of funds into dollar-denominated assets. Much of this pressure fell on the German mark, in view of Germany's low nominal interest rates relative to rates abroad and Germany's sizable current account deficit. Funds were shifted out of marks not only into dollars but into sterling and French francs as well. Within the European Monetary System (EMS), the German mark and the French franc were pushed to their respective intervention points, and the Bundesbank and the Bank of France were obliged to absorb substantial amounts of marks against francs. At the same time, the EMS currencies as a group declined against the dollar.

As a result of the flow of funds into dollar assets, the dollar rose in October to end the three-month period up a net 7 percent against the German mark and other currencies in the EMS, 3½ percent against the Swiss franc, and 1⅜ percent against the Canadian dollar. Over this same period, sterling rose a net 4⅜ percent against the dollar and the yen moved up by 7⅜ percent.

With the dollar in demand, the United States authorities stepped up their acquisitions of currencies to repay debt and rebuild balances. Operations were conducted in New York, Frankfurt, and on occasion in the Far East. When strong one-way pressures emerged late in October, the Desk intervened, sometimes forcefully, in the market as a buyer of German marks. Purchases of marks in the spot market totaled $1,770.7 million equivalent between mid-September and end-October. Moreover, as part of the effort to repay debt and rebuild balances, the United States authorities purchased a total of $346.6 million of marks from correspondents, divided about equally between the Federal Reserve System and the Treasury, and $132.9 million of outright forward marks on behalf of the Treasury. As a result, the Federal Reserve was able to complete liquidation of its swap debt with the Bundesbank by the end of the period.

In addition to its mark purchases, the United States authorities bought over the three-month period $87.5 million equivalent of Swiss francs, including $25 million equivalent in the market and $62.5 million equivalent from correspondents. Of this amount, $62.6 million equivalent was added to System balances and $24.9 million equivalent went into Treasury balances. The Federal Reserve also took advantage of opportunities to buy $158.6 million of French francs to complete repayment of its swap debt with the Bank of France.

During the August-October period, the Federal Reserve realized $14 million in profits on its foreign exchange operations and the Exchange Stabilization Fund (ESF) realized $0.1 million. As of the end of the period, the Federal Reserve showed valuation profits of $12.7 million on its foreign exchange assets while the ESF showed valuation losses of $372.8 million on its foreign exchange assets. The Treasury's general account showed valuation profits, related to the outstanding issues of securities denominated in foreign currencies, of $138.8 million.

Subscriptions to the *Quarterly Review* are free. Multiple copies in reasonable quantities are available to selected organizations for educational purposes. Single and multiple copies for United States and for other Western Hemisphere subscribers are sent via third- and fourth-class mail, respectively. All copies for Eastern Hemisphere subscribers are airlifted to Amsterdam, from where they are forwarded via surface mail. Multiple-copy subscriptions are packaged in envelopes containing no more than ten copies each.

Quarterly Review subscribers also receive the Bank's Annual Report.

Library of Congress Catalog Card Number: 77-646559

Federal Reserve Bank of New York
33 Liberty Street
New York, N.Y. 10045

Return Postage Guaranteed