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In This Issue . . .

Business accounting relies greatly on the balance sheet as a tool for analyzing a firm's financial health. Similar practices do not prevail in national economic accounting. Economic analysts instead rely mainly on the GNP accounts as a measure of national economic performance.

In the first article in this *Review*, "The U.S. Balance Sheet: What Is It and What Does It Tell Us?" Keith M. Carlson provides an overview of the U.S. balance sheet. He explains its basic structure and gives some examples of its usefulness in examining economic questions. One of the most important uses of the balance sheet, says Carlson, is to analyze the role of financial structure in the process of economic growth. The chief benefit of the U.S. balance sheet, as currently prepared, is that it forces the user to take a long-term perspective to detect changing economic trends.

* * *

In the second article in this *Review*, "Divisia Monetary Services Indexes for Switzerland: Are They Useful for Monetary Targeting?" Piyu Yue and Robert Fluri derive alternative monetary aggregates for Switzerland that are based on economic aggregation theory, Divisia M1 and Divisia M2. Noting that the historical relationship between the Swiss National Bank's principal policy instrument, the monetary base, and inflation appears to have broken down in the 1980s, they compare the performance of their two new aggregates and simple-sum M1 and M2 in explaining Swiss inflation. They find that Divisia and simple-sum M2 perform somewhat better than the M1 aggregates; however, their evidence suggests that simple-sum M2 cannot be controlled. They conclude that simple-sum M2 is unlikely to be an adequate substitute for the monetary base for policy purposes, but that the other aggregates are potentially worthy of further investigation.

* * *

One of the principal roles of the Federal Reserve System is to provide the United States with currency. This role places the Fed at the center of the U.S. currency system, a system that provides the foundation for our monetary and financial systems. In the third article in this issue, "The U.S. Currency System: A Historical Perspective," Steven Russell uses historical examples to define currency and currency systems, describe the various forms that currency can take and identify the distinctive features of the U.S. currency system. He also provides a short history of the U.S. currency system from its origins through the end of the Civil War.

In recent years, Russell notes, there has been considerable interest in alternative currency systems. Many of the alternatives that have been proposed are patterned after systems that existed in the past. Defenders of the modern U.S. currency system, says the author, frequently

portray it as the outgrowth of a process of natural selection: as the U.S. economy evolved, less efficient systems were rejected by the public in favor of more efficient ones. This portrayal interprets the very fact of the modern system's existence as evidence of its superior efficiency. Russell's account suggests that economic Darwinism has not played a dominant role in the development of the modern U.S. currency system. Historically, U.S. currency systems seem to have risen and fallen for reasons that had more to do with political crises—particularly, major wars—than with efficiency considerations.

* * *

Keith M. Carlson

Keith M. Carlson is an assistant vice president at the Federal Reserve Bank of St. Louis. Thomas A. Pollmann provided research assistance.

The U.S. Balance Sheet: What Is It and What Does It Tell Us?

BUSINESS ANNUAL REPORTS provide two basic accounting statements—a balance sheet, which is also termed a statement of condition, and an income statement. A firm's balance sheet lists the dollar value of its assets and liabilities as of a specific date. A firm's income statement lists its revenues and expenses (the difference being profit) for a year. Similar statements are prepared on a national level in the United States. Analogous to a firm's income statement, a nation's production of goods and services for a year (as well as its spending and saving decisions) are summarized in its gross national product (GNP) accounts. Analogous to a firm's balance sheet, the U.S. balance sheet lists the dollar value of assets and liabilities for U.S. residents. The flows that are identified in the GNP accounts and elsewhere are linked to changes in the levels of assets and liabilities reported in this balance sheet.

The GNP accounts receive the most attention simply because they focus on current production and income, which in turn, affects and is affected by, the level of employment. These accounts provide vital information on the short-run performance of the economy. On the other hand, the U.S. balance sheet generally receives little attention. This might be because it is incomplete, including only nonhuman wealth (see

shaded insert on page 5), and seems to be more appropriate for long-term analysis.

The purpose of this article is to provide an overview of the U.S. balance sheet. Its structure is explained and its usefulness is illustrated by examining trends in some individual balance sheet items. Further examples of its usefulness are given by examining balance sheet ratios such as the financial interrelations ratio, the net foreign balance ratio, the ratio of business capital to household capital and the relation of net worth to inflation.

THE STANDARD U.S. BALANCE SHEET

A balance sheet shows the position that a business or household, or the economy as a whole, has reached as a result of its past activity. It reflects flows of real and financial activity plus any revaluations of stocks because of price changes. Table 1 summarizes the U.S. balance sheet for 1990 as currently prepared by the Board of Governors of the Federal Reserve System.¹

General Definitions

A balance sheet usually shows all assets and all liabilities, with the difference called net worth.

¹Board of Governors (1991). This is called the C.9 release.

Table 1

Standard U.S. Balance Sheet: 1990 (billions of dollars)¹

National Net Assets	Beginning-of-year value	End-of-year value	Percent change
Tangible assets	\$16,017.2	\$16,241.7	1.4%
Reproducible assets	12,163.6	12,501.3	2.8
Residential structures	4,546.0	4,603.9	1.3
Nonresidential structures	4,633.0	4,811.0	3.8
Inventories	1,050.8	1,062.7	1.1
Consumer durables	1,933.8	2,023.7	4.6
Land at market value	3,853.6	3,740.4	-2.9
Net foreign assets	-670.1	-694.5	—
Foreign assets owned by U.S. residents	852.5	941.0	10.4
Minus: U.S. assets owned by foreigners	1,522.6	1,635.5	7.4
U.S. monetary gold and SDRs	21.0	22.0	4.8
NATIONAL NET ASSETS (consolidated)	\$15,368.1	\$15,569.2	1.3%
National Net Worth, by sector			
Private net worth (consolidated)	\$18,104.5	\$18,573.0	2.6%
Household net assets	9,899.3	10,019.6	1.2
Nonfarm noncorporate business	1,949.2	1,919.0	-1.5
Farm business	720.4	758.2	5.2
Nonfinancial corporate business	3,778.4	3,870.8	2.4
Private financial institutions net assets	1,757.2	2,005.4	14.1
U.S. holdings of foreign corporate stock ²	95.8	90.5	-5.5
Minus: Foreign holdings of U.S. corporate stock	257.4	218.4	-15.2
Public sector net assets	-2,323.4	-2,616.5	—
State and local governments	-99.9	-137.8	—
U.S. government ³	-2,223.5	-2,478.7	—
Unallocated financial assets	-251.3	-259.4	—
NATIONAL NET WORTH	\$15,368.2	\$15,569.2	1.3%

¹Source: Board of Governors of the Federal Reserve System (1991).

²All corporate equities were subtracted in calculating net assets of households and financial institutions.

³Includes sponsored credit agencies and monetary authority.

The U.S. balance sheet is unusual, however, because the largest category of assets, human wealth, is not included. National net worth, as currently estimated, is all nonhuman wealth.

For the national balance sheet, assets are divided into two types—tangible and financial. Tangible assets are economic goods that yield a stream of services in kind. Plant and equipment, housing, consumer durables and land are all examples of tangible assets. Financial assets are claims or rights to amounts of money now or in the future. For every financial asset owned by

an economic unit there is a corresponding liability owed by another economic unit. Financial assets can be categorized as fixed claims or variable claims; variable claims are called equities. Currency and deposits, notes, bonds and mortgages are all fixed claims. Corporate stock and the net worth of noncorporate business are equities. For a closed economy, financial assets equal financial liabilities. For an open economy, national net assets, or national net worth, is the total of all tangible assets, U.S. monetary gold and SDRs (special drawing rights created and distributed by the International Monetary Fund)

National Wealth and the U.S. Balance Sheet

A nation's wealth is defined as the value of all resources that contribute to the production of goods and services. The broadest definition would include the goods and services resulting from both market and nonmarket activities. To better understand the process of wealth accumulation, economists have classified wealth as human vs. nonhuman and tangible vs. intangible. The following classification is typical:¹

Tangible wealth
 Human
 Nonhuman
 Intangible wealth
 Human
 Nonhuman

Tangible wealth is material in form, that is, it is "touchable." Its quality, or productivity, depends greatly on intangible factors. Human tangible wealth is essentially a population count, which might also take into account the average age of the population. Nonhuman tangible wealth is most familiar and consists of structures, durable goods, inventories and natural resources. This type of wealth is sometimes classified as reproducible (man-made) and nonreproducible (natural).

For all tangible forms of wealth, it is simply not possible to estimate value without considering the effect of intangible factors. The most fundamental intangible embodied in human wealth is a person's stock of knowledge. Likewise, health conditions or the state of medical knowledge, have an important bearing on the value of society's human wealth. Still another example of intangible human wealth is the mobility of the population which reflects socio-political factors affecting the job market. There are also other forms of intangible wealth that are difficult to classify as human or nonhuman. These include personal and national security, freedom, equity, privacy and a system of property rights.²

Nonhuman tangible wealth is easy to understand, although estimating its value is difficult

because of interaction with the state of technology which is an intangible factor. The value of structures and equipment reflects the state of productive know-how. Similarly, the value of physical resources like land, subsoil assets, forests and water depend on the state of technology.

Because so many forms of wealth are immeasurable (or at least appear to be), wealth estimation has generally been limited to its nonhuman component. Furthermore, such estimates have been generally restricted to market-oriented activities. The importance of human wealth to national wealth has been established clearly, but there is little agreement on how to measure it. Human wealth is not traded in a market in the same sense as property, so its value must be determined indirectly. Two fundamental approaches have been used: (1) accumulate past investments in education and training and allow for depreciation, or (2) estimate the discounted value of future income. Two of the best-known studies of human wealth in the United States are by Kendrick (1976) and Jorgenson and Fraumeni (1989).³ The table below compares their estimates of the distribution of wealth for 1969 (the latest year for which they both provide estimates).

Distribution of Private National Wealth: 1969

	Kendrick	Jorgenson-Fraumeni
Human wealth	69.2%	93.9%
Tangible	21.5	N.A.
Intangible	47.7	N.A.
Nonhuman wealth	30.8	6.1
Tangible	29.0	N.A.
Intangible	1.8	N.A.
Total wealth per capita (1990 dollars)	\$8,572	\$92,540

Kendrick estimates that U.S. human wealth (including both tangible and intangible) is

¹Kendrick (1976).

²Juster (1973), pp. 40-48.

³Also see Eisner (1989), whose estimates of human wealth as a proportion of the total lie between those of Kendrick and Jorgenson and Fraumeni.

about 2.3 times that of total nonhuman wealth. Jorgenson and Fraumeni, on the other hand, estimate that human wealth is 15.4 times that of nonhuman wealth. The methodologies underlying the estimates are very different with the Jorgenson-Fraumeni study including estimates of the value of nonmarket activities such as household production and leisure time.

Despite considerable advances in the understanding of wealth, measurement and estima-

tion of many forms of wealth are still in an early stage of development. As a result, a complete accounting of U.S. wealth is not yet available on a regular basis; published national balance sheets are generally limited to the market value of nonhuman wealth. Depending on the estimates, this portion represents between 6 percent and 31 percent of total national wealth. In this sense, the U.S. balance sheet is far from complete.

and net foreign assets—a balancing item (the difference between foreign assets owned by U.S. residents and U.S. assets owned by foreigners).

The Standard U.S. Balance Sheet in 1990

Table 1 shows 1990 beginning-of-year and end-of-year values in current dollars. The difference reflects saving and investment flows (net of depreciation) during the year plus revaluations of existing assets.²

For the economy as a whole, the bottom line is national net assets, or national net worth. It is clear that national net assets are dominated by tangible assets.³ In fact, with the recent rapid growth in foreign ownership of U.S. assets, the value of tangible assets on U.S. soil has exceeded the value of the nation's net assets (owned by U.S. residents) since 1983.

On the net worth side of the standard balance sheet, no liabilities are shown. National net worth is defined as the sum of private net worth, public sector net assets and unallocated financial assets (plus a balancing item for foreign and U.S. holdings of each other's corporate stock).

Private net worth is broken down further by sector. Household "net assets" and private finan-

cial institutions sector "net assets" are presented along with the net worth of each type of business.⁴ This is useful for analysis, but one must keep in mind that households are the ultimate owners of businesses.

Our focus below is on long-term trends in the United States, but one development in 1990 is worthy of mention. As shown in table 1, national net worth grew only 1.3 percent or, given the increase in GNP prices (GNP implicit price deflator) of 3.9 percent, it declined 2.6 percent in real terms. This weak performance is attributable, in part to, declines in real estate prices.

Trends in National Net Worth and GNP

One possible use of balance sheet information is to view national net worth as a measure of macroeconomic performance over time. Does it yield information that differs from that of GNP? Many years ago, Raymond Goldsmith and Robert Lipsey concluded that "National balance sheets are not intended as a device to measure economic growth over time, but they are essential to study the relations between the financial superstructure and the real infrastructure, which constitute an important aspect of economic growth."⁵ With 30 years of new data, does this conclusion still hold?

²The Board's C.9 release also contains sector balance sheets for households, farm, nonfarm, noncorporate and corporate business, private financial institutions and the rest of the world. For definitions of sectors, see Board of Governors (1980).

³Tangible assets for federal, state and local governments are not included in the C.9 release. For further discussion of the government balance sheet, see Boskin, Robinson and Huber (1989).

⁴Equities and pension fund reserves are subtracted from household net worth to obtain net assets. Private financial institutions' net assets are obtained by subtracting corporate equities and adding pension fund reserves to their net worth.

⁵Goldsmith and Lipsey (1963), p. 25. Also, see Goldsmith (1985, 1982, 1969, 1966).

Figure 1
GNP and National Net Worth

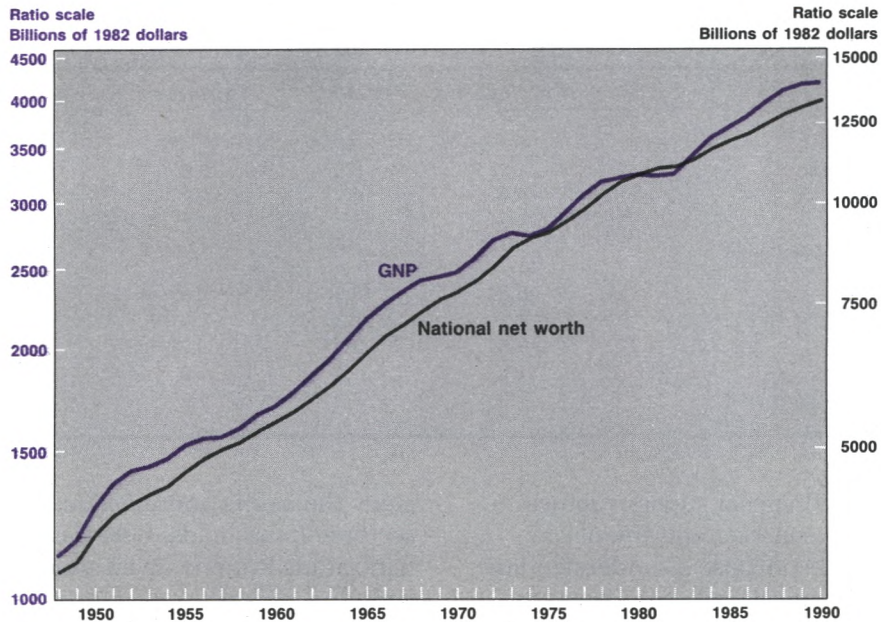


Figure 1 shows real national net worth (NNW) and real GNP from 1948 to 1990.⁶ Over the full period, the growth rates are the same—3.2 percent. Real NNW is a relatively smooth series, while real GNP displays considerable volatility. Real NNW shows little cyclical movement, indicating that tangible assets are valued over a long horizon, even if they are utilized more or less intensively during the business cycle.

Table 2 summarizes and compares GNP and NNW during the 1948-90 period. The reference periods were chosen to conform with different inflation experiences. The 1948-64 period was one of relatively low inflation, averaging 2.2 percent per year. From 1964 to 1981, inflation accelerated; it was 3.1 percent in 1965 and 9.4 percent in 1980. The 1981-90 period is more difficult to define—disinflation from 1981 to 1985 and then moderately accelerating inflation over the past five years.

During the period of relatively low inflation from 1948 to 1964, GNP and NNW grew at simi-

lar rates in both nominal and real terms. Periods of accelerating or decelerating inflation, however, produced differing growth rates for the two measures. From 1964 to 1981, both nominal and real NNW grew faster than GNP. During the 1980s, the opposite occurred; NNW growth slowed relative to that of GNP in both nominal and real terms.

Based on the post World War II experience, NNW shows the same long-term trends as GNP. While the growth rates of NNW and GNP can deviate for several years, for purposes of long-term analysis they appear to give the same answers. Goldsmith's and Lipsey's conclusion from almost 30 years ago appears to be confirmed.

AN ALTERNATIVE VERSION OF THE U.S. BALANCE SHEET

Since GNP accounts are limited to data on the current production of goods and services and generally omit financial transactions, they are of

⁶The C.9 release also includes data for 1945-47, but these years are omitted because of distortions caused by the transition to peace from World War II. Real NNW was calculated by using the Department of Commerce

constant-cost net stock of fixed private capital, assuming that the real value of land changed at the same rate as real GNP and deflating all other components with the GNP deflator.

Table 2

A Comparison of GNP and NNW as Measures of Macroeconomic Performance (compounded annual rates of change)

Measure	1948-64	1964-81	1981-90	1948-90
GNP	6.1%	9.4%	6.7%	7.6%
GNP deflator	2.2	6.5	3.6	4.2
Real GNP	3.9	2.7	2.9	3.2
Population	1.7	1.1	1.0	1.3
Real GNP per capita	2.1	1.6	1.9	1.9
NNW	5.8	10.9	4.2	7.5
NNW deflator	2.1	7.2	2.0	4.1
Real NNW	3.6	3.4	2.2	3.2
Population	1.7	1.1	1.0	1.3
Real NNW per capita	1.9	2.3	1.2	1.9

little use in studying financial superstructure and the relation between real and financial assets.⁷ To achieve the purpose of understanding relations between financial and real assets, the national balance sheet has to be viewed more broadly than NNW.

Financial assets play a key role in the economic development of market economies, enabling the transfer of lenders' excess purchasing power to finance spending for borrowers. If an economic unit consumes less than its income, it accumulates assets or retires debt, thereby adding to its net worth. If an economic unit chooses to accumulate tangible assets less than its saving, it must accumulate financial assets or reduce liabilities. Similarly, if an economic unit chooses to accumulate tangible assets in excess of saving, it must borrow or sell off financial assets.

Because of this fundamental role for financial markets, it is useful to focus on national balance sheets that include the financial asset-liability structure.⁸ A full understanding of the forces that are driving NNW requires a supplementary analysis of financial assets and liabilities.

A Goldsmith-Type U.S. Balance Sheet in 1990

Table 3 summarizes the U.S. balance sheet in a Goldsmith-type format. It uses the same data that are in the Board of Governors report, but

sums the assets and liabilities for the separate sectors—households, businesses and private financial institutions. Even though there is double counting, this procedure preserves detailed information about financial assets and liabilities.

Although the approach used here follows Goldsmith in principle, it is incomplete because the Board of Governors report does not provide estimates of tangible assets held by governments. By adding privately held financial assets to tangible assets, the value of tangible assets held by business and the equity claims on business held by households are both included.

The assets and liabilities are for the private sector, so the balancing item is really a meaningless residual that includes government liabilities, rest-of-world liabilities, as well as equities and net worth of the private sector. Consequently, this balance sheet is not offered as a substitute for the standard Board of Governors version, but as a supplementary summary of the Board's report with a focus on private sector assets and liabilities.

The 1990 values in table 3 indicate that private sector holdings of financial assets were 1.68 times the value of tangible assets at the beginning of the year and 1.70 times at the end of the year. The sector breakdown of this ratio summarizes the structure of the U.S. economy. The household sector's holdings of financial assets are about twice their holdings of tangible assets.

⁷The term "financial superstructure" is attributable mainly to Goldsmith. It refers to all aspects of the system of financial markets that channels the funds of savers into investment. For more detailed discussion, see Board of Governors (1980).

⁸For a discussion of the importance of keeping financial assets and liabilities on the national balance sheet, see Goldsmith and Lipsey (1963).

Table 3

Goldsmith-Type U.S. Balance Sheet: 1990 (billions of dollars)¹

Assets	Beginning-of-year value	End-of-year value	Percent change
Tangible assets	\$16,000.8	\$16,223.2	1.4%
Reproducible assets	12,147.2	12,482.9	2.8
Households	5,598.7	5,760.2	2.9
Nonfinancial business	6,271.3	6,417.9	2.3
Private financial institutions	277.2	304.8	10.0
Land	3,853.6	3,740.3	-2.9
Households	1,458.6	1,315.8	-9.8
Nonfinancial business	2,376.5	2,404.4	1.2
Financial institutions	18.5	20.1	8.6
Financial assets	26,813.6	27,571.8	2.8
Households	13,854.5	14,091.4	1.7
Nonfinancial business	2,434.5	2,566.1	5.4
Private financial institutions	10,524.6	10,914.3	3.7
TOTAL ASSETS	\$42,814.4	\$43,795.0	2.3%
Liabilities, Equities and Net Worth			
Liabilities (private sector)	\$18,510.0	\$19,390.3	4.8%
Households	3,620.7	3,961.3	9.4
Nonfinancial business	4,634.3	4,840.4	4.4
Private financial institutions	10,255.0	10,588.6	3.3
Other liabilities, equities and net worth ²	24,304.4	24,404.7	0.4
TOTAL LIABILITIES, EQUITIES AND NET WORTH	\$42,814.4	\$43,795.0	2.3%

¹Source: Board of Governors of the Federal Reserve System (1991). Follows Raymond Goldsmith's procedure of combining (adding) sector balance sheet items to derive a 'total' balance sheet. This balance sheet is incomplete, however, because it omits assets held by government and foreigners.

²Calculated as a residual. Reflects considerable double counting and also includes liabilities of government and foreigners.

The nonfinancial business sector, on the other hand, holds financial assets equal to about 30 percent of its tangible assets. Financial institutions, almost by definition, hold very few tangible assets.

Financial assets can be compared with liabilities to show the net monetary creditor status of the different sectors. Households hold financial assets about 3.7 times as large as their liabilities, with fixed claims almost 1.5 times as large as liabilities. Nonfinancial businesses have liabilities almost twice as large as their financial assets, with the ratio about the same when variable claims and liabilities are subtracted. Private fi-

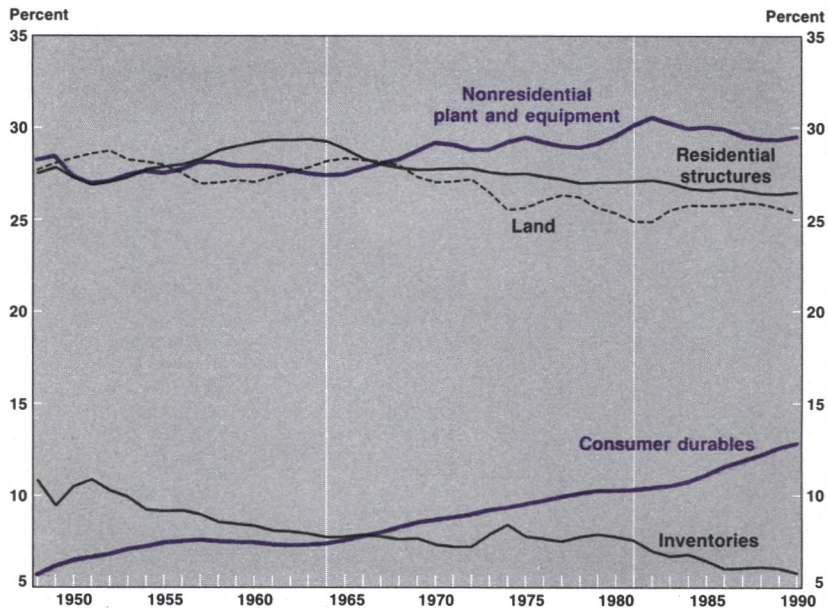
ancial institutions are net monetary creditors, although not to the extent that households are.

Reproducible assets are divided into the same categories as in table 1 and in the GNP accounts—residential structures, nonresidential plant and equipment, inventories and consumer durables. Financial assets can be divided into many types, but here they are grouped into five categories—currency and deposits, credit market instruments, equities (both corporate equities and the net worth of noncorporate business), reserves (pension fund and life insurance) and other (which includes security and trade credit).⁹

⁹"Credit market instruments is a core group of debt claims that is the principal medium used by nonfinancial sectors in raising funds through formal credit channels." [Board of Governors (1980), pp. 42-43.] It includes all government

securities, corporate and foreign bonds, mortgages, consumer credit, bank (not elsewhere classified) and other loans.

Figure 2
Distribution of Tangible Assets



Trends in Total Assets

Postwar trends in total assets are summarized by charting the components of both tangible assets and financial assets relative to their respective totals.

Tangible assets—Figure 2 summarizes the major components of tangible assets in 1982 dollars relative to the total of tangible assets, but broken down by type of asset as in table 1 (the same as in the GNP accounts). Vertical lines (1964 and 1981) correspond to the inflation episodes in table 2. For inventories and land, the trend generally has been downward throughout the postwar period. In the case of consumer durables, the trend is upward throughout the period. For fixed residential investment, the trend was upward before 1964 but has been downward since then. Fixed nonresidential investment has trended upward, although there appears to be a flattening in the 1980s.

The relationship between the growth of real reproducible tangible assets and inflation was examined.¹⁰ The conventional wisdom is that investors view tangible assets as a good hedge against inflation.¹¹ Table 4 shows the correlation coefficients for the year-to-year percent change in reproducible tangible assets and inflation. None of the coefficients is significant and positive for each of the subperiods. Explaining trend movements in the components of tangible assets is apparently much more complex than indicated by a simple inflation model.

Financial assets—Privately held financial assets were collected into categories as shown in figure 3. Currency and deposits (broadly defined) drifted downward from the end of World War II until the early 1960s, stabilized until 1972, shifted to a higher level and then fell from 1984 to 1990. This category reflects a number of financial innovations throughout the period, notably certificates of deposit in the

¹⁰Land was not included because it is fixed and nonreproducible. Its real value can change but not its quantity.

¹¹Higher rates of inflation increase the uncertainty associated with rates of return on financial assets, making tangible assets more attractive to investors. See Cagan and Lipsey (1978).

Table 4

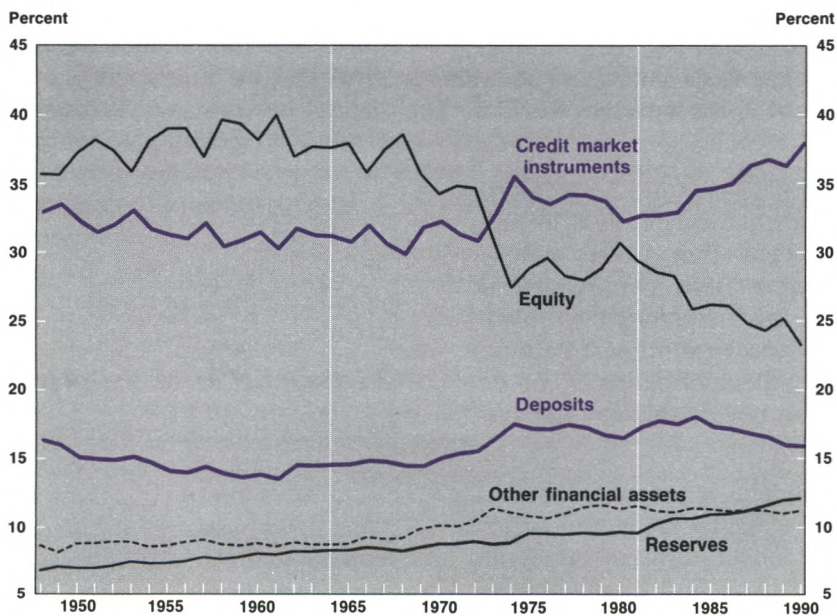
Correlation Coefficients: Percent Change in Reproducible Tangible Assets (1982 dollars) and Inflation¹

	1948-90	1948-64	1965-81	1982-90
Consumer durables	-.16	.30	-.64*	-.86*
Residential structures	-.42*	.60*	-.28	-.88*
Nonresidential plant and equipment	.08	.52*	-.50*	-.57
Inventories	.23	.66*	.04	-.35

*Significant at the 5 percent level

¹Inflation is year-to-year percent change in GNP deflator.

Figure 3 Distribution of Financial Assets



1960s, money market mutual funds in the 1970s and the payment of interest on checkable deposits in the 1980s.¹²

The trend of credit market instruments was quite flat until the mid-1970s, shifted to a higher level until the early 1980s and rose sharply from 1982 to 1990. Because federal securities are an

important component of credit market instruments, about half of the increase in the 1980s can be traced to the rapid growth in the federal debt.

The equity portion of financial assets shows a pattern generally the opposite of that for credit market instruments. The downward trend in

¹²For a brief financial history of the United States, see Council of Economic Advisers (1991), chapter 5.

Table 5

**Correlation Coefficients: Percent Change in Financial Assets
(1982 dollars) and Inflation¹**

	1948-90	1948-64	1965-81	1982-90
Currency and deposits	-.13	-.41	-.26	-.19
Credit market instruments	-.42*	-.69*	-.31	-.84*
Life insurance and pension fund reserves	-.38*	-.56*	-.18	-.03
Equities	-.20	.15	-.15	-.28
Other financial assets	-.15	.57*	-.37	-.83*

*Significant at the 5 percent level

¹Inflation is year-to-year percent change in GNP deflator.

equities began in the high-inflation 1970s, but continued through the disinflation of the 1980s.¹³ These trends suggest a complementary relation between equities and credit market instruments (including government securities). The total of these two categories has varied between 60 and 70 percent of all financial assets since World War II.

Life insurance and pension fund reserves rose gently until 1980, and then accelerated in the 1980s. This recent acceleration is consistent with a number of explanations. One would be that it represented a favorable long-term planning response to the deceleration of inflation. Another would be the demographics of the decade which included a rise in the average age of the population.¹⁴

The residual component of financial assets, called "other," reflects mainly trade and security credit. This category moved upward slowly but steadily until the mid-1970s and then stabilized.

As with reproducible tangible assets, coefficients were calculated for the correlation between the percent change in financial assets in 1982 dollars and inflation. These results are summarized in table 5. Most of the coefficients are negative, although most are insignificant. Even though nominal financial assets tend to increase with inflation, their growth is generally outpaced by inflation so that in real terms there is an inverse relationship.

SOME USES OF THE BALANCE SHEET

The U.S. balance sheet covers a relatively small portion of the nation's wealth. However, it can yield insights into particular relationships that cannot be fully analyzed using information only from GNP accounts. The accumulation of flows into stocks provides a built-in long-term perspective that is generally missing with GNP accounts. By lengthening the time perspective, balance sheet information can shed new light on some commonly held perceptions about economic trends.

Financial Interrelations Ratio

One of the most important applications of balance sheet information is the calculation and analysis of the financial interrelations ratio.¹⁵ This ratio measures the size of the financial superstructure relative to the real infrastructure. Specifically, it is the ratio of the value of financial assets to the value of tangible assets.

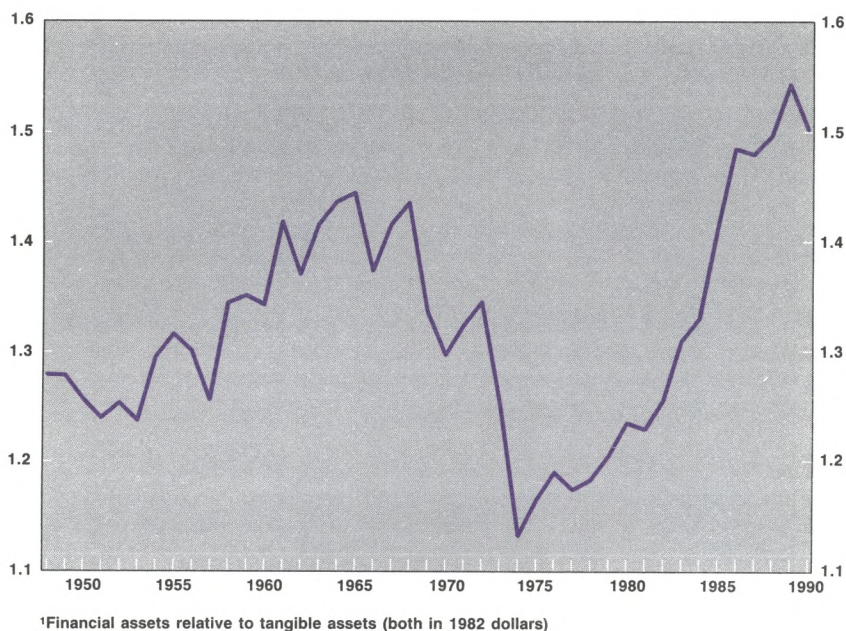
The financial interrelations ratio provides a framework for the analysis of the relationship between financial development and economic growth. However, as Goldsmith points out, "Economic growth is so complex a phenomenon, obviously determined or influenced by basic factors of a physical, technological, and mass-psychological nature, that an attempt to isolate the effects of apparently secondary forces such

¹³It was formerly believed that corporate stocks were a hedge against inflation. Fischer and Modigliani (1978) suggest that this changed when investors realized that higher inflation carries with it a higher real tax burden.

¹⁴Carlson (1990).

¹⁵Goldsmith (1966).

Figure 4
Financial Interrelations Ratio¹



as the character of financial institutions and the nature of credit practices does not promise success.”¹⁶ Generally, the argument is that a rise in the interrelations ratio indicates a broadening of the range of financial assets and institutions. This promotes the flow of saving into its most productive uses which stimulates economic growth and increases productivity.¹⁷

Figure 4 shows the interrelations ratio for the 1948-90 period. The factors influencing its movement are numerous and complicated, although inflation appears to have played a role. Prices of tangible assets, the denominator in the ratio, tend to increase more than other prices during periods of accelerating inflation, and by a lesser amount when it decelerates. The ratio fell to its postwar low during the high-inflation period of the 1970s before rising during the disinflation of the 1980s. Such an explanation is simplistic because a full analysis of the interrelations ratio would consider all other factors entering into its

determination. Nonetheless, inflation is a factor influencing the ratio.¹⁸ On the other hand, real GNP growth does not appear to be related systematically to the ratio, especially since the mid-1970s. Thus, even though the financial interrelations ratio shows interesting movements in the postwar period, it is only a starting point in the analysis of financial structure and economic growth.¹⁹

One facet of the interrelations ratio that has produced concern in the 1980s is the rapid growth of credit market debt in the private sector. Expansion of debt permits more spending than otherwise, but adds to the severity of a recession when the pace of economic activity slows. To maintain debt payments, households and businesses have to restrain their spending or default on their loans. Widespread loan defaults could endanger the economic health of the financial system.

¹⁶Goldsmith (1969), p. xi.

¹⁷For more detailed discussion of this theory, see Goldsmith (1969), pp. 390-401. Also see Shaw (1973).

¹⁸Goldsmith (1969), p. 97.

¹⁹Recently an argument has been offered challenging the

notion that growth in financial structure is always beneficial. See Fingleton (1991).

Figure 5
Credit Market Debt Relative to Tangible Assets

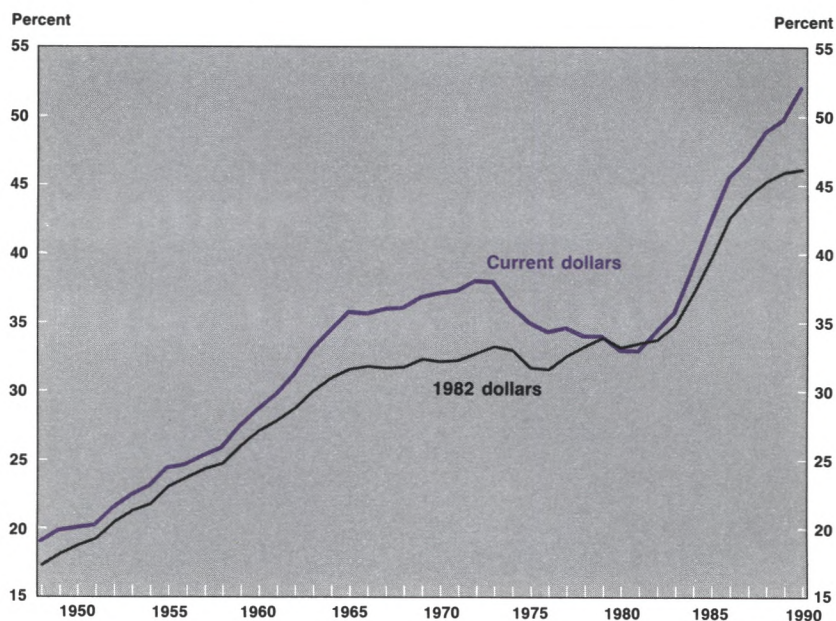


Figure 5 puts the 1980s expansion of debt into perspective. All credit market debt of households, private nonfinancial business and private financial institutions is included and measured against total privately held tangible assets. Debt expanded at an 11 percent annual rate from 1983 to 1990, pushing the ratio of debt to tangible assets to a historical high of 0.52. The extent of the increase is dampened somewhat when the ratio is calculated with 1982 dollars, but 1990 is still at a historical high; it appears to be leveling off, however. Whether this debt burden is "too high" will probably not be answered until the strength and duration of the recovery from the recent recession is clear.

Inflation and the Distribution of Net Worth

An additional use of balance sheet information is to analyze the effect of inflation on the net worth of various sectors. The standard theory of such effects is outlined in the shaded insert

at right.²⁰ Figure 6 shows the distribution of private net worth among sectors.

The proportion of private net worth held by households gradually increased from 1948 until inflation accelerated sharply in the mid-1970s; it then declined until 1981. Since then, households' share of net worth has risen as the disinflation continued through most of the decade. These responses are typical of a sector that is a net monetary creditor.

The nonfinancial business sector has shown a variety of long-term trends, but the response to the acceleration and deceleration of inflation is similar for the three subsectors because they are all monetary debtors. Farm business has been in a long-term decline throughout the post-war period, interrupted by a slight increase from 1971 to 1980 which primarily reflected a rise in farm real estate values. Nonfarm noncorporate business declined as a share of private net worth until 1976, increased until 1980, and

²⁰No attempt is made here to measure anticipated inflation. However, based on current procedures, the variances of change in inflation and the unanticipated change have been found to be similar. See Ball and Cecchetti (1990), p. 242.

Inflation and the Balance Sheet

Inflation has many effects, but most discussed are its effects on the distribution of income and wealth.¹ If inflation were fully and correctly anticipated, nominal interest rates on fixed claim assets would adjust to compensate for the declining purchasing power of the principal. Generally, however, interest rates have not completely compensated for inflation. As a result, periods of inflation have been accompanied by arbitrary transfers of real net worth from net monetary creditors to net monetary debtors when inflation is accelerating, or vice versa when it is decelerating.

The key factors in determining whether economic units will benefit from, or be harmed by, inflation are (1) whether the inflation is anticipated and (2) whether the economic

units are net monetary creditors. Net monetary creditors are harmed by unanticipated inflation because the purchasing power of their monetary assets declines more than the real value of their monetary liabilities. Similarly, net monetary debtors benefit from unanticipated inflation. These effects take place without any action on the part of the economic unit and represent a passive redistribution of wealth.

Even if inflation is anticipated and reflected in nominal interest rates, added uncertainty about future prices can affect economic decisions.² As a result, economic units will attempt to redistribute their assets for protection from inflation. This will elevate prices of tangible assets relative to financial assets.

¹See Bach and Stephenson (1974), Cagan and Lipsey (1978), Conard (1964), Fischer and Modigliani (1978) and Kessel and Alchian (1962).

²See Cagan and Lipsey (1978).

Figure 6
Distribution of Private Net Worth

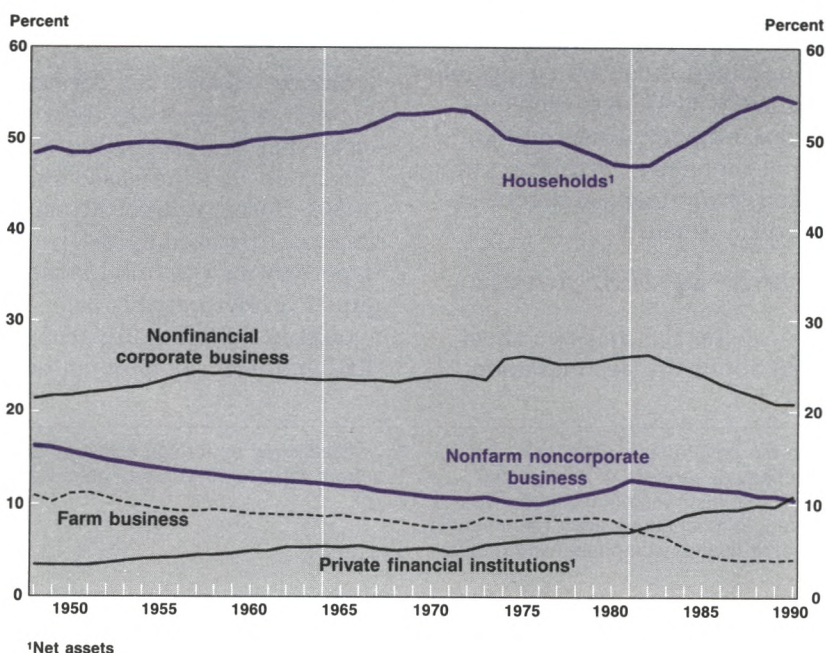
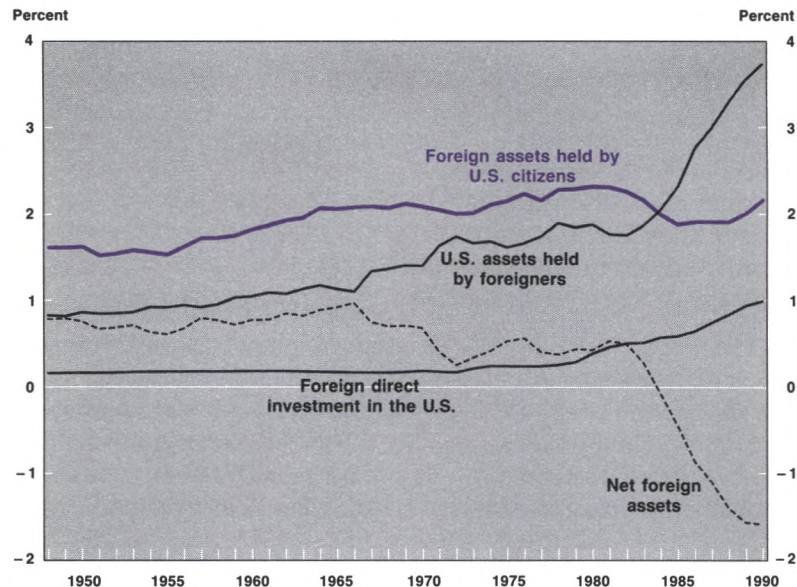


Figure 7
Net Foreign Assets Relative to Total Assets Held
by the Private Sector



since then has moved back to its 1976 level. Nonfinancial corporate business is difficult to characterize for the full period. Its response to the acceleration and deceleration of inflation seems quite clear, with its net worth proportion increasing during the acceleration and then falling back during the disinflation.

The net worth of private financial institutions does not seem to be affected much by swings of inflation, contrary to the well-known problems of the savings and loan industry. Private financial institutions are net monetary creditors, but the difference between their financial assets and their liabilities is very small.²¹

Foreign Ownership of U.S. Assets

Another application of the U.S. balance sheet is to examine concern about the accumulation

of U.S. assets by foreigners during the 1980s. A common perception is that foreigners could eventually own more than 50 percent of business capital leading to the potential for foreign control of the U.S. economy. This would threaten U.S. economic sovereignty and national security.²² Balance sheet data can be used to examine this concern.

Figure 7 shows net foreign assets as a percentage of total assets in the United States. It is clear that the proportion of U.S. assets held by foreigners has increased sharply since the early 1980s. Foreign direct investment, however, has increased from only 0.4 percent in 1980 to about 1 percent of U.S. total assets in 1990. With continued growth at this pace, foreign ownership would not exceed 50 percent for 800 years.²³ Rather than "signaling an economy in decline,

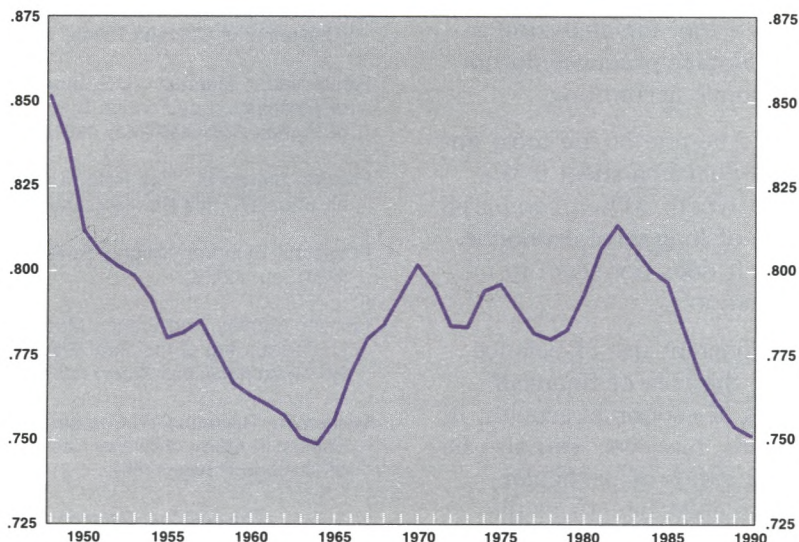
²¹It is difficult to relate to the private financial sector because of its heterogeneity. It consists of commercial banking, savings institutions, insurance (including private pension funds and state and local government retirement funds) and other (including finance companies and mutual funds).

²²This concern and several others are examined in Ott (1989).

²³These trends in foreign ownership are unlikely to continue. For example, assets of U.S. business acquired or

established by foreign investors dropped by 25 percent from 1989 to 1990. See Fahim-Nader (1991).

Figure 8
Ratio of Business Capital to Household Capital¹



¹Nonresidential plant and equipment divided by residential structures plus consumer durables (all in 1982 dollars)

such investment by foreigners is a measure of the economy's vigor."²⁴ On a worldwide basis, foreign direct investment increases economic welfare by moving resources from less to more productive uses.

Ratio of Business Capital to Household Capital

Another concern that developed in the 1980s was that the United States was not channeling its saving into the "right" kind of investment.²⁵ Mainly because of a combination of inflation and tax shelters, savings were directed toward household capital rather than productive business capital.²⁶ Business investment in plant and equipment is a major vehicle for increasing economic growth. It boosts productivity by providing more capital per worker and also embodies technological improvements. Household capital, on the other hand, provides services to consumers but does not add directly to productive capacity. Figure 8 shows the ratio of nonresi-

dential plant and equipment to household capital—the sum of consumer durables and residential structures.

Following World War II, households enlarged their stock of capital until 1964. From 1964 to 1970, growth of business capital stock exceeded that of household capital stock. For the next 12 years, business and household capital grew at roughly the same rate. Since 1982, however, the growth of household capital has exceeded that of business capital. Boosting the overall level of saving is the primary vehicle for stimulating economic growth. There is also potential for faster growth by designing policies that direct the flow of saving away from household capital into business capital.²⁷

SUMMARY

Economic analysts rely mainly on the nation's GNP accounts as a source of information on economic performance. For purposes of under-

²⁴Ott (1989), p. 63.

²⁵This view is developed in Rutledge and Allen (1989).

²⁶For a discussion of the effects of the Tax Reform Act of 1986, see Fazzari (1987) and Slemrod (1990).

²⁷For a more complete discussion of saving and its role in economic growth, see Cullison (1990) and Harris and Steindel (1991).

standing the forces at work in the determination of current production, GNP accounts are indispensable. Generally overlooked, however, is another source of information—the nation's balance sheet. Business accounting relies greatly on the balance sheet as a tool for analyzing a firm's financial health. Similar practices do not prevail in national economic accounting.

What would appear to be one of the most important items in the U.S. balance sheet is the measure of national net worth. When compared with GNP as a measure of long-term economic performance, however, it does not seem to offer much added information.

Probably the most important use of balance sheet data is to analyze the role of financial structure in the process of economic growth. A variety of other questions, however, can also be examined by developing ratios of particular balance sheet items. The chief benefit of the U.S. balance sheet, as it is currently prepared, seems to be that it forces the user to take a long-term perspective to detect changing trends. What appeared to be major concerns during the 1980s sometimes took on a different interpretation when viewed from the perspective of the U.S. balance sheet over the entire post-World War II period.

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Piyu Yue and Robert Fluri

Piyu Yue is a research associate scholar at the IC² Institute, University of Texas at Austin. Robert Fluri is an economist at the Swiss National Bank. This article was written while both authors were visiting scholars at the Federal Reserve Bank of St. Louis. Lynn Dietrich provided research assistance.

Divisia Monetary Services Indexes for Switzerland: Are They Useful for Monetary Targeting?

FROM 1973 TO 1989, INFLATION in Switzerland was roughly one-half that in the United States. For example, consumer prices in Switzerland rose 3.5 percent per year during this 16-year period compared with the 6.6 percent average annual rise in U.S. consumer prices. Similarly, Swiss wholesale prices rose at an annual rate of 2 percent during this period in contrast to the nearly 6 percent annual average increase in the U.S. producer price index. Indeed, the Swiss inflation experience, along with that of West Germany, is often cited as an excellent example of the gains that accrue to a nation whose central bank conducts monetary policy by announcing—and achieving—a target for the growth of a monetary aggregate.

The Swiss central bank has used monetary base growth rate targets since 1980. Because the historical relationships between monetary base growth and economic activity have changed markedly since the end of the 1980s, the Swiss have begun to reconsider the use of annual monetary aggregate targets, and are considering the potential usefulness of broader monetary aggregates as indicators of monetary policy.

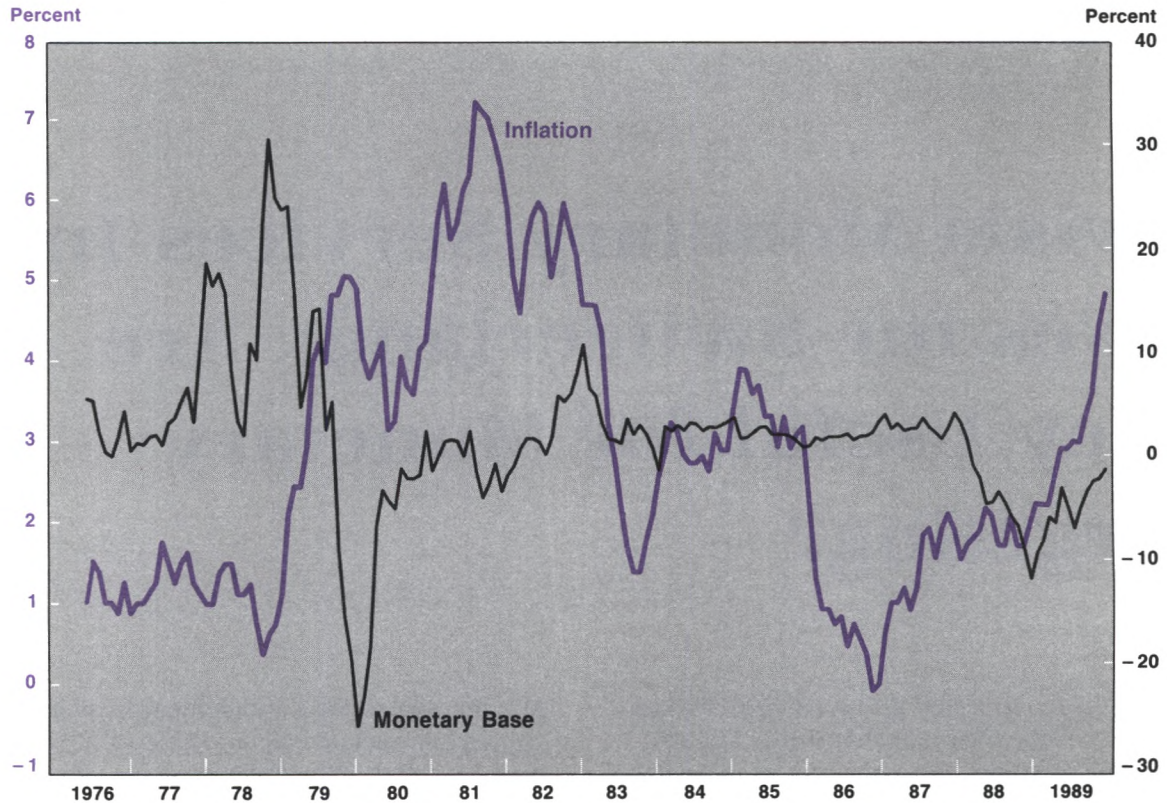
This paper develops two alternative broader monetary aggregate measures, Divisia M1 and

M2, for Switzerland and compares their potential usefulness as monetary indicators with the Swiss M1 and M2 aggregates as usually defined. First, however, we show why questions have been raised about the continued usefulness of the annual monetary base growth rate target in Switzerland. We then discuss the methodology underlying the Divisia approach to constructing monetary aggregates and use this methodology to derive Swiss Divisia M1 and M2 measures. Next, we examine the relationship between Swiss inflation and the growth rates of Swiss M1 and M2 and the Swiss Divisia M1 and M2 aggregates to determine their relative usefulness as monetary policy indicators. Finally, we examine the relationships between these various monetary aggregates and the monetary base to assess the extent to which the Swiss central bank could control their growth.

SOME BACKGROUND ON THE SWISS MONETARY BASE

Prior to 1986, the relationship between the monetary base and economic activity in Switzerland was quite close; this link, however, has broken down since then. The sudden change

Figure 1
Inflation and Swiss Monetary Base Growth



can be illustrated, in part, by looking at the relationship between inflation and the growth rate of the monetary base as depicted in figure 1. Until 1986, Swiss inflation movements lagged about three years behind corresponding variations in the base money growth rate. Since 1986, however, this pattern no longer holds. For example, the sharp drop in Swiss inflation in 1986 was attributable to substantial reductions in the prices of imported goods. Consequently, it appears that monetary base growth neither contributed to this decline nor provided any warning that it would occur; indeed, the growth of the Swiss monetary base was virtually constant from 1984-1987.

Similarly, movement in the Swiss monetary base from 1987-1989 (in particular, the sharp drop in 1988) yielded neither warning nor explanation of the sharp rise in Swiss inflation in 1989. This change followed two significant insti-

tutional innovations in the Swiss banking system. First, a new electronic interbank payment system (Swiss Interbank Clearing System, SIC) was introduced in the summer of 1987. Then, on January 1, 1988, reduced reserve requirements on Swiss bank deposits went into effect. In response to these changes, Swiss banks have sharply reduced their reserve balances at the Swiss National Bank (SNB). Swiss bank reserves dropped from more than SF8 billion (about \$5.5 billion) at the end of 1987 to SF3 billion (about \$2.1 billion) by the end of 1989.

As a result of changes in the relationship between the monetary base and inflation, the continued usefulness of the monetary base as a monetary policy indicator has been questioned. One suggestion is to rely more on broader monetary aggregates as monetary policy indicators.

MONETARY AGGREGATION

Generally, central banks worldwide use essentially identical procedures to construct their nations' monetary aggregates. They first define the specific aggregate—that is, they determine which financial components it will include—and then they simply “add” its selected components together. Not too surprisingly, these monetary aggregates are called “simple-sum” aggregates.

Simple-sum aggregation has been criticized for failing to distinguish between the differing degrees of monetary (transaction) services and store-of-value services provided by the components in the monetary aggregate. Presumably, only the former (that is, monetary or transaction) services should be included when a monetary aggregate is considered. Friedman and Schwartz (1970) have described this problem:

This [summation] procedure is a very special case of the more general approach discussed earlier. In brief, the general approach consists of regarding each asset as a joint product having different degrees of “moneyness,” and defining the quantity of money as the weighted sum of the aggregate value of all assets, the weights for individual assets varying from zero to unity with a weight of unity assigned to that asset or assets regarded as having the largest quantity of “moneyness” per dollar of aggregate value. The procedure we have followed implies that all weights are either zero or unity. The more general approach has been suggested frequently but experimented with only occasionally. We conjecture that this approach deserves and will get much more attention than it has so far received. (pp. 151-52)

As Friedman and Schwartz surmised, economic aggregation theory and statistical index number theory have been used to provide both theoretical and empirical solutions to the problem of monetary aggregation.¹ This research has led to the development of alternative monetary aggregates, in particular, the Divisia monetary service measure.²

The Divisia Index Number

Index numbers are widely used to provide a single broad measure for a disparate collection

of items. Well-known examples of index numbers are the industrial production index, the consumer price index and the producer price index. These index numbers depend upon both the prices and quantities of items included in the index because the values of commodities involved are determined by their physical quantities and corresponding prices.

Because quantities of financial assets are measured in terms of “dollars,” simply adding the balances of various monetary components would appear to be a natural approach to measuring monetary aggregates. Consequently, it is not surprising that simple-sum monetary aggregates have been used extensively throughout the world. However, economic theory suggests that various monetary aggregate components differ in terms of their “liquidity” and, thus, may have substantially different effects on economic activity. If this is so, the simple-sum procedure may actually be inappropriate for measuring “monetary service flows” in the nation. Instead, an alternative approach that involves calculation of Divisia indices may provide superior alternatives to measuring monetary aggregates when compared with the traditional simple-sum monetary measures.

Theoretically, the Divisia index number is derived from the economic aggregation theory and first-order conditions for utility optimization. An expanded discussion of the Divisia approach appears in appendix 1 of this paper. Empirically, the Divisia index number is estimated from a nonlinear function of the quantities and the corresponding *prices* of individual components that create the aggregate. Moreover, its growth rate is a linear combination of the growth rates of its components, where the weights (or coefficients) on the components are their average *expenditure* shares. In comparison, the simple-sum index is the linear sum of the quantities of the components in which the weight (coefficient) given to each component is *unity* and their prices have no effect on the index. The growth rate of the simple-sum index is also a linear combination of the growth rates of its

¹See Barnett (1980).

²Use of Divisia monetary aggregates appears in Barnett and Spindt (1982), Donovan (1978), Farr and Johnson (1985), Belongia and Chalfant (1989), among others.

components, where the coefficients are equal to the quantity shares.³

Differences between the behavior of Divisia and simple-sum aggregates stem from the different weights assigned to the growth rates of the components, which measure their contributions to the monetary aggregates. Coefficients called “shares” are expressed by the notations S_{it}^* and S_{it} for various components used to determine the Divisia and simple-sum indexes, respectively, in the discussion that follows.

In calculating the Divisia index, the share of each component is the ratio of the expenditures on the monetary service flows it provides to the total expenditure on monetary service from all components in the aggregate; as such, it represents an “expenditure share.” In contrast, shares for components in the simple-sum index are equal to the quantities of the balances held in each component divided by the total balances of all components in the aggregate. In general, these two types of shares yield different values and move diversely over time. For example, the expenditure share of time deposits in Swiss M2 in January 1980 was 0.0856; its quantity share, in contrast, was 0.3681. In January 1988, however, the expenditure share of time deposits in Swiss M2 was 0.2823, while its quantity share was 0.4527.

For the components of simple-sum monetary aggregates, the only data required to compute their respective shares are quantities of the components themselves. In contrast, for Divisia aggregates, the prices of the components—which involve their interest rates—must also be obtained in order to compute their expenditure shares.

The User Costs of the Monetary Assets

As noted above, one major problem involved in computing Divisia index numbers for monetary aggregates is in determining the relevant prices of the individual monetary assets that

make up the aggregate. In economic aggregation theory, monetary assets are treated as commodities and their prices are defined similarly to rental prices of durable goods. In this approach, it is assumed that people receive monetary services from holding money to finance their consumption. In doing so, they forego higher yields typically available on other financial assets. While monetary services are considered consumed during some given period, money stock (like any durable good) is not generally consumed during this period. Because monetary services are flow variables—not stock variables—they should be evaluated by their rental prices or user costs. Therefore, Divisia index numbers can be used to measure the monetary service flows provided by various monetary assets in the economy only if the user costs of these assets can be correctly defined and accurately measured.

The appropriate user costs of monetary assets are based on microeconomic theory and are derived by examining the representative consumer’s optimal intertemporal consumption pattern and monetary asset portfolio allocation.⁴ These user costs are measured as the opportunity costs of foregone interest associated with holding funds in different types of monetary assets. The opportunity cost is obtained by comparing each asset’s rate of return to that on a *benchmark* asset with the highest rate of return.

Under the relevant consumer theory, the benchmark asset is assumed to provide no liquidity or other monetary services. Because it is held only for accumulating and transferring wealth across time, its interest rate is the highest in the economy. Consumer theory, however, does not specify other characteristics of the benchmark asset that would enable researchers to identify the actual benchmark asset to be used in empirical studies.

Barnett and Spindt (1982) have suggested that, while human capital might best fit the theoretical concept of the benchmark asset, no satisfactory empirical data exists on its rate of return. In their research, they found that

³By definition, the simple-sum aggregate is denoted such that

$$SIM_{it} = \sum mc_{it}$$

$$dSIM_{it}/SIM_{it} = \sum (mc_{it}/SIM_{it})(dmc_{it}/mc_{it})$$

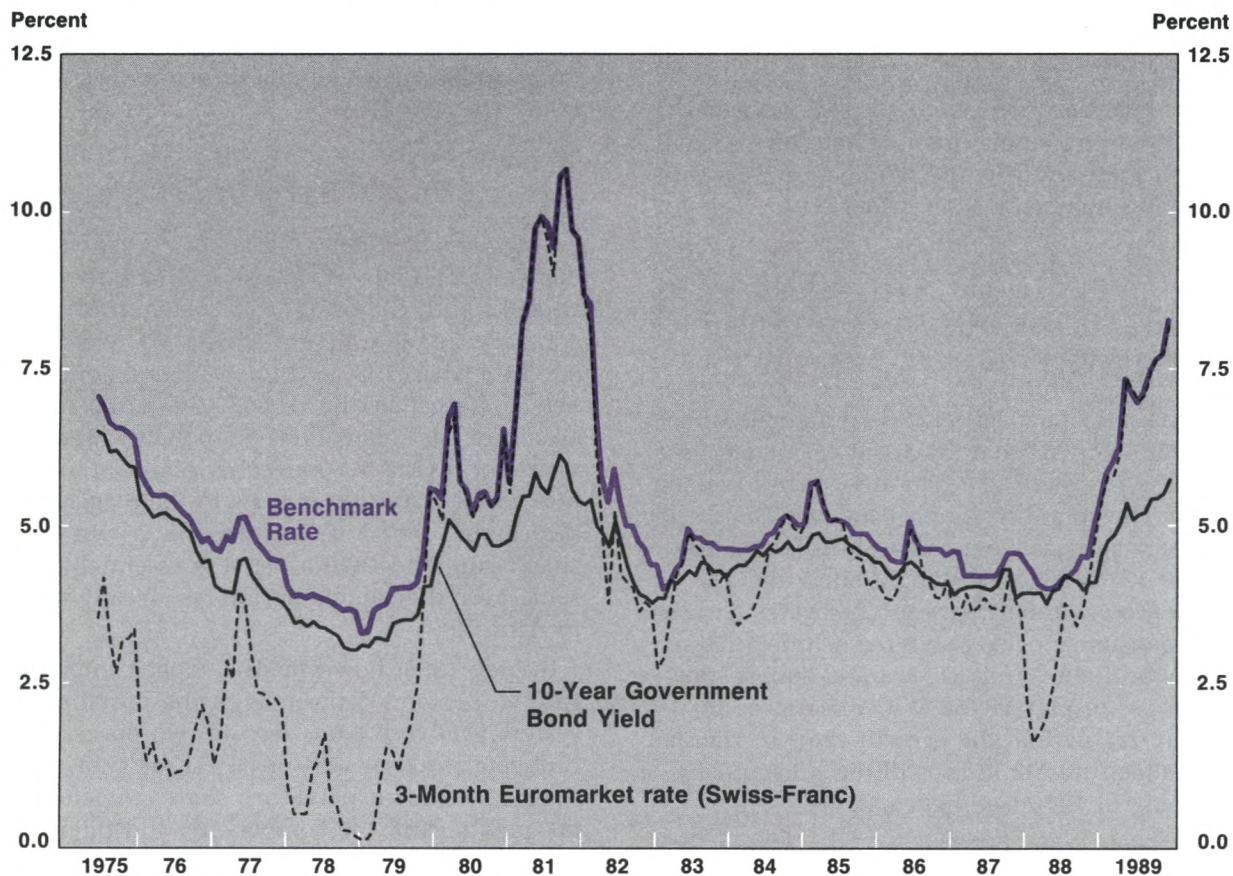
where mc_{it} is the quantity of the i -th component. Thus, approximately

$$\ln(SIM_{it}) - \ln(SIM_{it-1}) = \sum S_{it}(\ln(mc_{it}) - \ln(mc_{it-1})),$$

where $S_{it} = mc_{it}/SIM_{it}$ is the quantity share of the i -th component. This equation shows that the growth rate of the simple-sum aggregate is a linear combination of the growth rates of its components with weights equal to the fractions of the quantities of the components to the simple-sum aggregate.

⁴See Barnett (1978).

Figure 2
Selected Swiss Interest Rates



$$R_t = \max\{r_{baa}, r_{it}, i=1,2, \dots, n\}$$

provided the best available *proxy* for the theoretical benchmark rate, where r_{baa} is Moody's series of seasoned Baa corporate bond rates and r_{it} is the own rate of return on each of the components of L (the broadest U.S. monetary aggregate defined by the Federal Reserve Board).⁵ Although Donovan (1978) used the nominal rate of return on "bonds" to compute the rental price of interest-bearing money for Canada,

many researchers have used the approach adopted by Barnett and Spindt.

In this paper, we use the Barnett-Spindt approach to generate a proxy for the Swiss benchmark asset rate (see appendix 2 for further details). The benchmark asset is either the long-term Swiss bond or short-term Euro-Swiss deposits, depending on which yield is higher. Thus, as shown in figure 2, the benchmark asset was long-term Swiss bonds before 1980, Euro-Swiss deposits during 1980-1981 (due to an

⁵In the user cost formula, R_t is the maximum available yield in the economy on any monetary asset which is a uniquely defined theoretical maximum available yield. Empirically, the proxy variable is defined by a long-term bond yield relative to the rates of return on all monetary components. The need for a long-term bond yield in measuring short-term holding-period yields is demonstrated by R. Shiller (1979). The Baa bond rate is used as a representative

yield for long-term debts of average risk. See Barnett and Spindt (1982).

inverted term structure of Swiss interest rates during this period), long-term Swiss bonds from 1982 to 1987 and Euro-Swiss deposits again in 1988-1989.⁶

The formula for the real user costs of monetary assets in period t is expressed as

$$u_{it} = (R_t - r_{it}) / (1 + R_t),$$

where u_{it} is the user cost of the i -th monetary asset, R_t is the nominal interest rate on the benchmark asset and r_{it} is the nominal interest rate on the i -th monetary asset in period t .⁷

COMPARISON OF THE BEHAVIOR OF SWISS DIVISIA AND SIMPLE-SUM MONETARY AGGREGATES

Divisia monetary aggregates and simple-sum aggregates for M1 and M2 were calculated using the Swiss monetary data described in appendix 2.⁸ The monthly simple-sum and Divisia monetary aggregates are indexed to equal 100 in June 1975.⁹ Figures 3 and 4 show the 12-month growth rates of these aggregates and the Swiss consumer price index from June 1976 to December 1989. While Divisia and simple-sum M1 indices display virtually identical growth rates in this period, the growth rates of Divisia and simple-sum M2 indices differ substantially beginning in 1979 (see figure 4).

From 1980-1981, for example, the growth of simple-sum M2 rose rapidly while that of Divisia M2 slowed markedly. From 1982 to 1983, in contrast, the opposite pattern can be observed in their respective growth rates. In 1989, however, the divergent pattern observed from 1980-81 occurs once again.

These widely divergent growth rates over extended periods for the simple-sum and Divisia M2 suggest that discussions about the appropriateness of alternative procedures used to con-

struct monetary aggregates are not merely "academic." In general, the direction and magnitude of growth in monetary aggregates are presumed to provide useful information about the current stance of monetary policy and the future course of economic conditions. Such extreme differences in the growth of alternative M2 measures (as shown in figure 4), however, may produce considerable difficulty in assessing that information.

Simple-Sum Vs. Divisia Monetary Aggregates: What's the Difference?

In Switzerland, M1 consists of currency (C), demand deposits with banks (DB) and demand deposits with the postal giro system (DP). To compare simple-sum and Divisia M1, we calculated the shares (S_{it} , S_{it}^*) for each component of M1. For most of the period, the respective shares of each monetary component for simple-sum and Divisia M1 moved so uniformly that their respective contributions to these aggregates are roughly equal. Therefore, the growth in simple-sum and Divisia M1 was essentially the same over the sample period (as already noted in figure 3).

In May 1989, however, the explicit interest rate on demand deposits with the postal giro system (DP) rose from zero to two percent, reducing the user cost of DP, U_3 (as shown in figure 5). Since expenditure shares depend both on quantities of the components and their user costs, DP's share (S_3^*) fell, reducing its weight in calculating Divisia M1. Therefore, since the introduction of explicit interest payments on DP had no effect on its weight in calculating simple-sum M1, the values S_3^* and S_3 diverged after May 1989. Since the values of S_3^* and S_3 are quite small, however, the difference between the growth of simple-sum and Divisia M1 after May 1989 is trivial.

Figure 5 shows that the user costs of the three Divisia M1 components (U_1 - U_3) follow

⁶Needless to say, such shifts in the benchmark asset raise questions about the validity of this approach and have resulted in criticisms of Divisia indices by a number of economists. We do not address this issue in this paper.

⁷The nominal user costs of monetary assets usually are expressed as

$$u_{it} = p_t^* \left[\frac{(R_t - r_{it})(1 - \tau_t)}{1 + R_t(1 - \tau_t)} \right],$$

where u_{it} is the user cost of the i -th monetary asset in period t , R_t is the benchmark rate in period t , r_{it} is the nominal interest rate on the i -th monetary asset; τ_t is the

marginal income tax rate, and p_t^* is the true cost-of-living index used to deflate all nominal quantities to real quantities. Since taxes are not considered here, we use the simplified formula.

⁸Weak separability conditions should be satisfied first to calculate a meaningful aggregate. However, we did not conduct weak separability tests; instead, we used the actual Swiss definitions of M1 and M2 and simply assumed that they are admissible aggregates. For details, see Belongia and Chalfant (1989).

⁹See appendix 2.

Figure 3
Inflation and M1 and Divisia M1 Growth

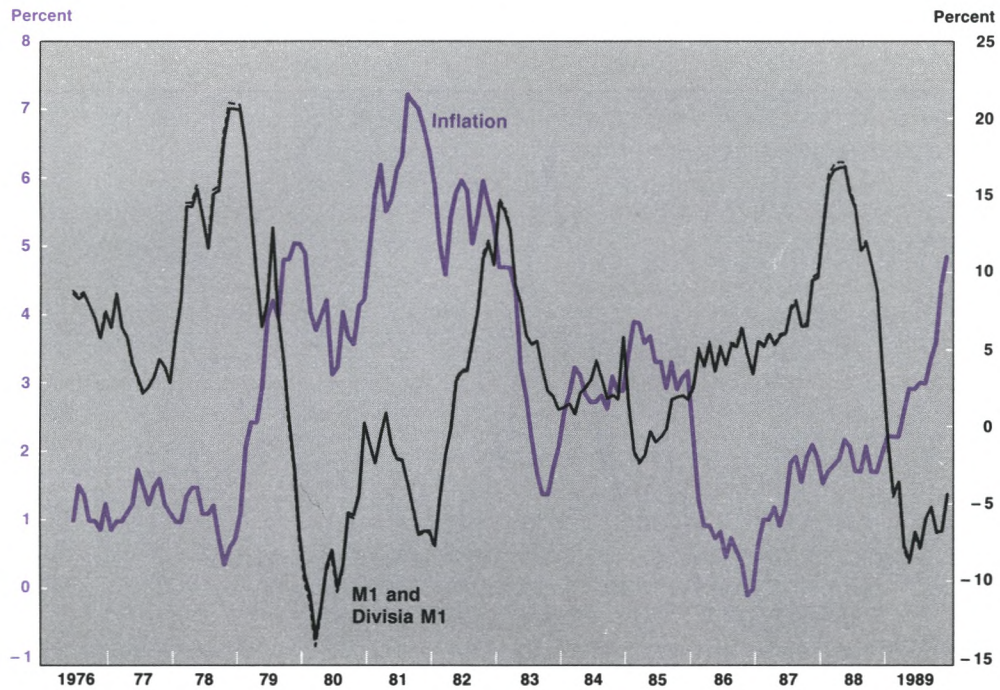


Figure 4
Inflation and M2 and Divisia M2 Growth

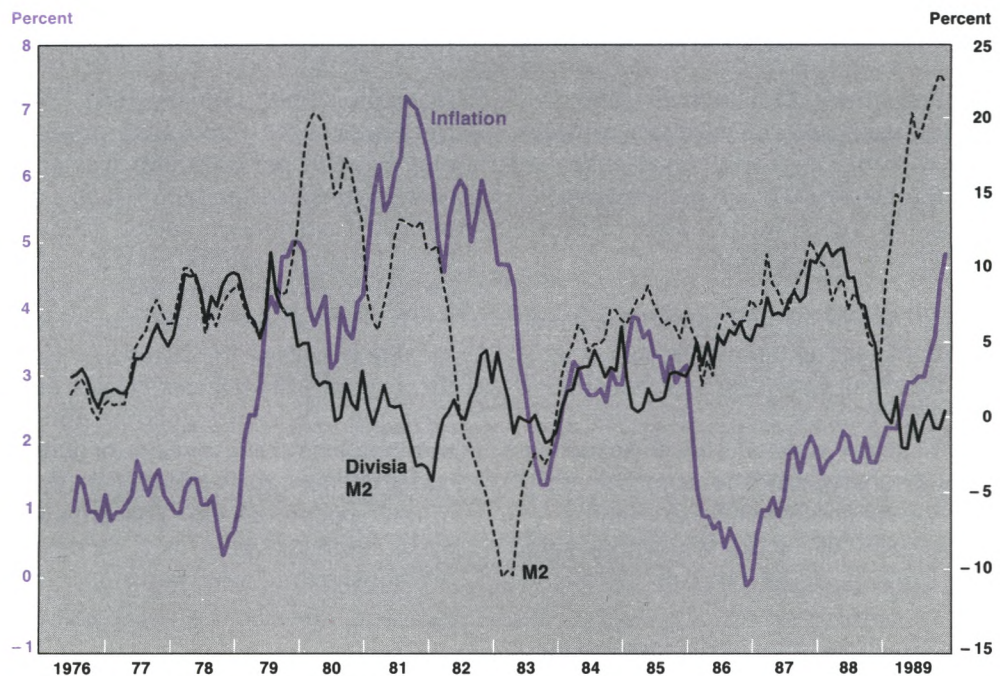
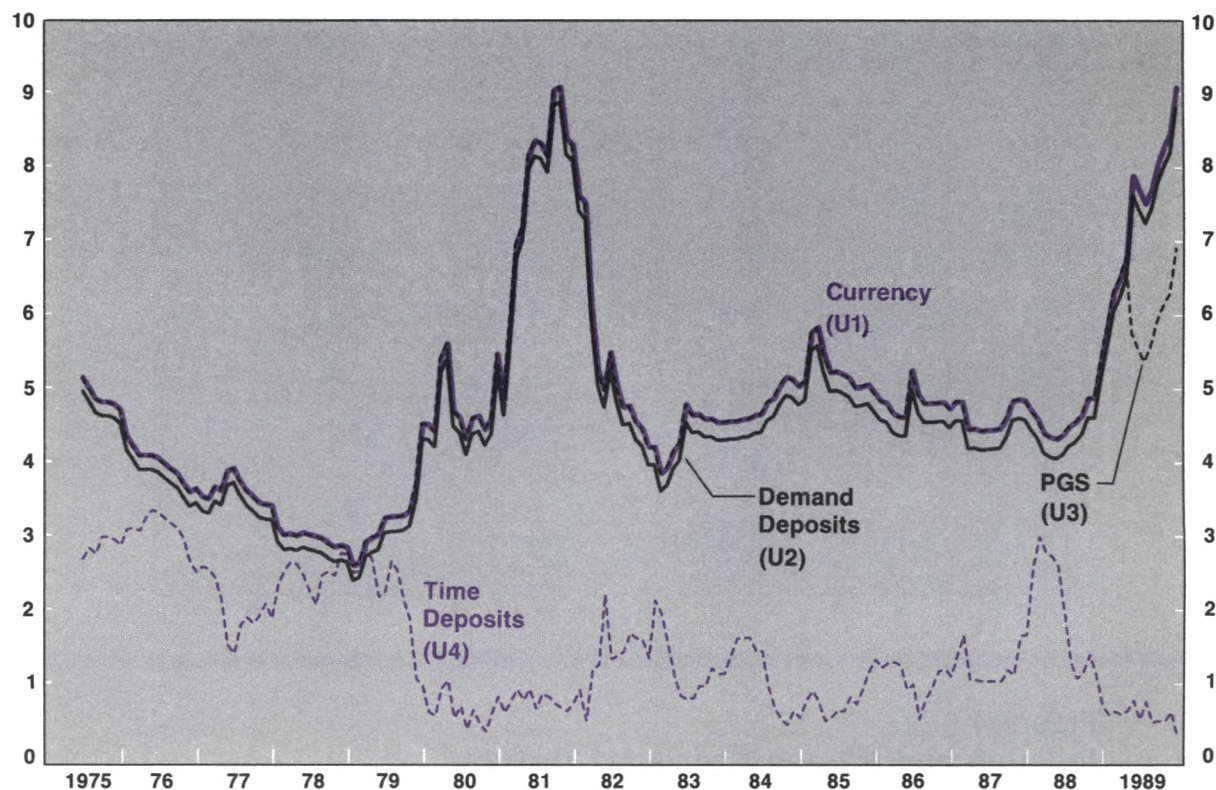


Figure 5
User Costs of Currency, Demand
Deposits, PGS, and Time Deposits



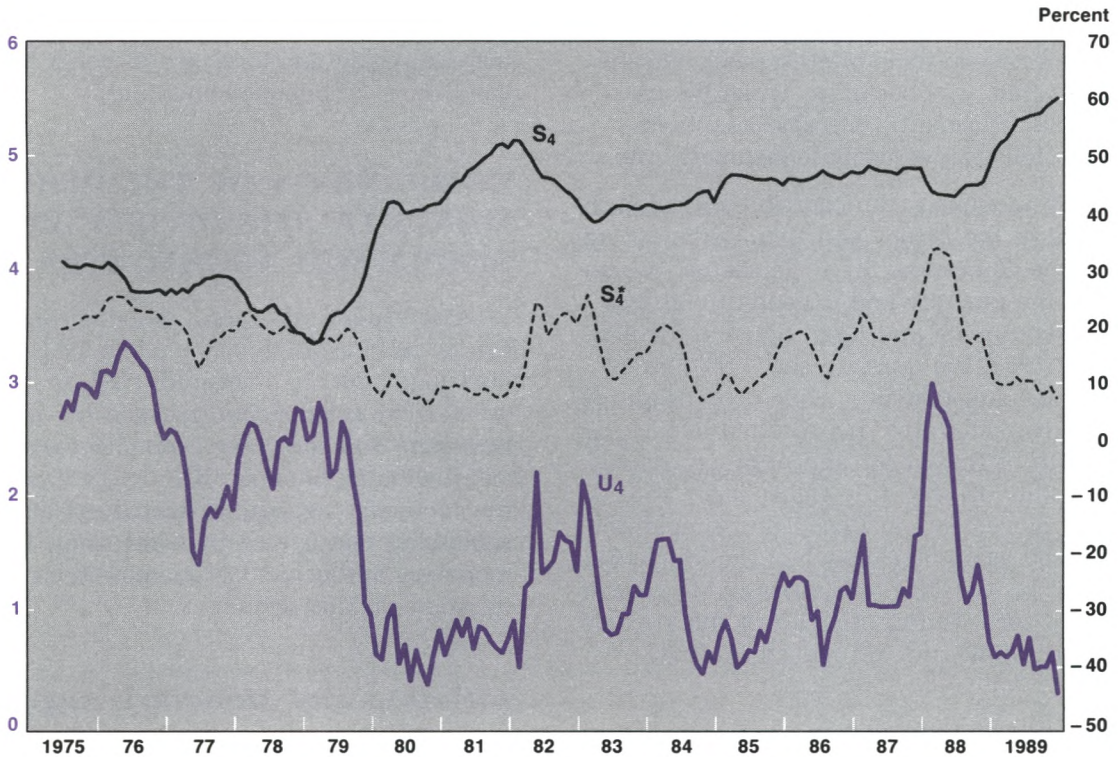
similar movements from 1975 through 1989, especially for the user costs of currency and demand deposits with banks. Thus, the *relative* user costs for the Divisia M1 components are nearly constant, making simple-sum M1 as useful as Divisia M1 over this period.¹⁰

Although the expenditure and quantity shares were similar for the M1 components, lower user costs for time deposits in M2 explain the divergent patterns shown earlier between simple-sum and Divisia M2. We can illustrate the importance of changes in the economic environment on the weights used by examining the different behavior of Divisia and simple-sum M2 over these time periods: January 1979 -

December 1981; January 1982 - November 1987; December 1987 - December 1989. At the beginning of each period, there was a significant change in Swiss monetary policy as measured by sharp movements in the Swiss monetary base. During these periods, changes in the economic environment were reflected in the levels of short-term and long-term interest rates. As noted earlier (in figure 2), we used the three-month Euro-Swiss Franc rate as the short-term rate, the Swiss government bond yield as the long-term rate and the benchmark rate was equal or close to the higher of these two rates in any specific period. The growth rate of the Swiss monetary base over these periods was previously shown in figure 1.

¹⁰This result is consistent with Hicks' (Hicks, 1946) conclusion that "when the relative prices of a group of commodities can be assumed to remain unchanged, they can be treated as a single commodity."

Figure 6
Simple-Sum Share S_4 and Divisia Share S_4^* of Time Deposits and User Cost U_4



The First Period: January 1979 to December 1981

During this period, the SNB's response to rising Swiss inflation was sharply slower growth in the Swiss monetary base (resulting in lower inflation in 1983-84). The abrupt rise in short-term Swiss interest rates produced an inverted yield curve for the next two years. The dramatic increase in interest rates on time deposits reduced their user costs (U_4) to nearly zero as their interest rates approached the benchmark rate (see figures 2 and 5).

How did this interest rate movement affect the monetary aggregates? Asset holders shifted from lower yielding securities into time deposits (TD) causing the quantity of time deposits to increase dramatically and the quantity of demand deposits with banks (DB) to decrease substantially. Furthermore, asset holders also shifted funds into time deposits from other financial assets

not included in M2. This sharp rise in the quantity of time deposits is indicated by the surge in their share in simple-sum M2, S_4 (shown in figure 6).

These changes produced quite different results in the Divisia M2 measure, however. As interest rates on time deposits increased relative to other interest rates, time deposits had lower opportunity costs and the monetary service flows from a given quantity of time deposits naturally fell. Thus, despite the large increase in time deposits, the expenditure share of the monetary service flows from time deposits actually declined during this period (see S_4^* in figure 6), as did the growth of Divisia M2 (see figure 4).

The Second Period: January 1982 to November 1987

During this period, the rate of inflation declined to lower levels and an extended period of

expansionary growth in the monetary base began in January 1982. The term structure of Swiss interest rates resumed its normal shape, with short-term interest rates below long-term interest rates. Figure 5 shows that the user costs of currency, demand deposits and demand deposits with the giro system (U_1 , U_2 , U_3) began to fall in 1982. This reflects the fact that the difference between their interest rates and the benchmark rate was declining, while the user cost of time deposits (U_4) increased as its interest rate fell relative to the benchmark rate.

As noted previously, the contributions of each component to the Divisia and simple-sum M2 aggregates are determined by their shares. We only display the quantity and expenditure shares for time deposits (S_4^* and S_4) in figure 6 for illustration. In 1982, the quantity share of time deposits (S_4) fell substantially, while its expenditure share (S_4^*) rose sharply. This resulted in the positive growth of Divisia M2 and negative growth of simple-sum M2 shown in figure 4 for 1982. Divergent movements in Divisia and simple-sum M2 occurred again in 1985 when the simple-sum M2 growth was positive, while Divisia M2 growth was almost zero. During the rest of this period, Divisia and simple-sum M2 moved similarly.

The Third Period: December 1987 to December 1989

Swiss inflation rose from 2 percent throughout most of 1988 to nearly 5 percent by the end of 1989. While both short- and long-term interest rates rose over this period, short-term rates rose relative to long-term rates. Moreover, the major institutional changes that took place reduced demand for the monetary base.¹¹ In response to these events, user costs of the first two components (U_1 and U_2) rose, while the user cost of time deposits (U_4) fell (figure 5); these movements were similar to those in the first period. However, as mentioned earlier, the user cost of demand deposits in the postal giro system (U_3) fell in May 1989 when the interest rate jumped from zero to two percent. Consequently, the Divisia and simple-sum M2 measures moved in opposite directions; simple-sum M2 rose sharply, while Divisia M2 fell substantially (figure 4).

These three episodes suggest that, at least for a monetary aggregate as broad as Swiss M2, different aggregation procedures produce monetary measures that can move quite differently and generate very distinct interpretations for the stance of policy and the likely course of economic conditions. Therefore, it is important to know which of the potential broader monetary aggregate measures are more closely related to key economic conditions.

COMPARISON OF THE PERFORMANCE OF THE DIVISIA AND SIMPLE-SUM AGGREGATES

To determine whether a monetary aggregate can be used as a monetary policy target, two questions must be answered. First, is there a satisfactory relationship between the monetary aggregate and some key economic variable, such as inflation or nominal GDP or GNP? Second, is the monetary aggregate strongly related to something that is directly controllable by the monetary authority? We examine both these questions in this section.

Inflation and Monetary Aggregates

To evaluate the first question, the relationship between selected Swiss monetary aggregates and inflation are compared. Specifically, quarterly Swiss inflation rates were regressed on distributed lags of selected Divisia and non-Divisia monetary aggregates. Because the sample is relatively small and because we would like to include enough lags to capture the significant effect of money growth on inflation, the Polynomial Distributed Lag (PDL) estimation technique was used.¹²

Ideally, it is desirable to use one of the commonly used lag-length selection methods for choosing both the lag length and the degree of the polynomial. However, for two of the monetary aggregates, simple-sum M1 and Divisia M1, the equations exhibited significant serial correlation. This complicates the application of these procedures for these aggregates. Because of this, when these aggregates were used, several specifications of both lag length and polynomial

¹¹See the data description in appendix 2.

¹²See Batten and Thornton (1983); Thornton and Batten (1985).

Table 1
PDL Regressions of Inflation on Money Growth

	Growth Rate of Simple-sum		Growth Rate of Divisia	
	M1	M2	M1	M2
PDL order	1	1	1	1
Lag	Coefficients of Distributed Lags			
0	0.00898	0.02740	0.00917	-0.01316
1	0.01232	0.02721	0.01257	-0.00653
2	0.01566	0.02702	0.01597	0.00010
3	0.01900	0.02683	0.01938	0.00672
4	0.02233	0.02664	0.02278	0.01335
5	0.02567	0.02646	0.02618	0.01998
6	0.02901	0.02627	0.02958	0.02661
7	0.03235	0.02608	0.03298	0.03323
8	0.03569	0.02589	0.03639	0.03986
9	0.03903	0.02570	0.03979	0.04649
10	0.04237	0.02552	0.04319	0.05311
11	0.04571	0.02533	0.04659	0.05974
12	0.04905	0.02514	0.04999	0.06637
13	0.05238	0.02495	0.05339	0.07299
14	0.05572	0.02476	0.05680	0.07962
15	0.05906	0.02458	0.06020	0.08625
16	0.06240	0.02439	0.06360	0.09287
17	0.06574	0.02420	0.06700	0.09950
18	0.06908	0.02401	0.07040	0.10613
Sum	0.74154	0.48838	0.75596	0.88322
t-Stat ¹	(3.1168)	(8.1203)	(3.1877)	(6.0924)
AR(1)	0.4673	0.0763	0.4596	0.2253
S.E.	0.00697	0.00611	0.00695	0.00625
Adj-R ²	0.5751	0.6729	0.5776	0.6579
D-W	1.9811	1.9409	1.9773	1.9249

S.E. is the standard error of the regression.

¹ The critical t-statistic value at the 5 percent significance level is 1.645.

degree were estimated. Specifications with relatively long lags and relatively low polynomial degrees produced the highest adjusted R-square. To keep the specifications comparable with those of simple-sum and Divisia M2 (which were chosen using the FPE criteria), results with lag lengths of 18 and first-degree polynomials are presented.¹³

To compare the long-run relationship of the monetary aggregates on inflation, we estimated the selected PDL models and computed the sum of coefficients of the distributed lags to test

whether the sum of the lagged money growth coefficients was significantly different from *zero*. The estimated coefficients and respective statistics are shown in table 1.

The results in table 1 show that monetary aggregates influenced Swiss inflation over periods of up to four or more years. With the exception of simple-sum M2, the monetary aggregates have roughly similar values for the sum of the coefficients on their distributed lags. The hypothesis that the sum of the lag coefficients is

¹³The identical polynomial degree was obtained for M2 and Divisia M2 by the Pagano-Hartley technique if a T-statistic of 2.0 is used for the critical value.

Table 2
F-Statistics for PDL Models¹

Growth rates	Divisia M2 and M1	Divisia M2 and Divisia M1	M2 and M1	M2 and Divisia M1
F-Stat.				
H ₁	0.0605	0.0726	1.8349	1.8349
H ₂	4.0645	3.9585	7.3115	7.1715

¹At the 5 percent significance level, the critical F value is 3.29.

zero was rejected in all cases at the 5 percent significance level.¹⁴

Because M1 and Divisia M1 are included in their respective M2 counterparts, we investigated whether the non-M1 components of M2 themselves added significant explanatory power in the inflation equation. Thus, we defined the *unrestricted* model as regressions of inflation on both the M2 and M1 PDLs; the *restricted* models were those with regressions of inflation on the M2 or M1 PDLs, respectively. The actual F-statistics and their 5 percent significance level critical values are shown in table 2. H₁ is the hypothesis that inflation can be explained by Divisia M2 or M2 alone; H₂ is the hypothesis that inflation can be explained by M1 aggregates alone. These hypotheses are tested against the corresponding unrestricted PDL model that inflation is explained jointly by simple-sum and Divisia M2 PDL and the M1 aggregates PDL.¹⁵

The results in table 2 show that the data failed to reject H₁, but did reject H₂. This result suggests that the broader aggregates M2 and Divisia M2 better explain Swiss inflation than does M1 or Divisia M1 alone.

Controllability

As noted earlier, the practical use of a monetary aggregate as an intermediate target depends on its controllability. Even if some monetary aggregate shares a close relationship with inflation

or nominal GDP, it would be of little use as a monetary *target* if its growth can not be controlled by monetary authorities. Since the central bank controls the monetary base, the relationships between it and the broader Swiss monetary aggregates are examined.

Because the cross correlations between the growth rates of monetary aggregates and the growth rate of the monetary base show a long-lag pattern, we used the PDL models to estimate their relationships. Again, because of significant serial correlation, various specifications of lag length and polynomial degree were estimated. However, they share the same qualitative properties. Table 3 displays the estimates of the 16-lag and first-degree PDL models.

Results show that the growth rates of M1, Divisia M1 and Divisia M2 are statistically significant in relation to the growth rate of the monetary base. However, a significant long-term relationship between the growth rate of the monetary base and simple-sum M2 is rejected at the 5 percent level of significance.

In addition, the contemporaneous growth rate of the monetary base is positively and significantly correlated to the growth rates of both M1 aggregates and the Divisia M2 aggregate. For simple-sum M2 growth, however, the contemporaneous and initial lagged growth rates of the monetary base have negative effects on its

¹⁴The hypothesis that the sum of the lag coefficients was unity failed to be rejected in all cases except for simple-sum M2. Thus, except for simple-sum M2, the results did not reject a one-to-one long-run relationship between the growth of the monetary aggregate and the rate of inflation.

The results for the monetary base are similar to those of the Swiss monetary aggregates; its adjusted R² (0.4880) was lower than those displayed in table 1. As shown in the first part of this paper, the relationship between inflation

and growth of the monetary base slipped considerably during 1986-89 (the end of the period examined); earlier, however, there had been a close link between Swiss inflation and long-run growth in the monetary base. Because the estimation period covers 1975-89, the recent "breakdown" in the monetary base growth-inflation relationship does not dominate the results.

¹⁵For both M2 and M1 aggregates, we take the same number of lags, 18, in the PDL models.

Table 3

PDL Regressions of Growth Rates for Monetary Aggregates on Growth Rate of Monetary Base

	Growth Rate of Simple-sum		Growth Rate of Divisia	
	M1	M2	M1	M2
PDL order	1	1	1	1
Lag	Coefficients of Distributed Lag for the Growth Rate of the Monetary Base			
0	0.39216	-.07127	0.38461	0.20584
1	0.36648	-.05610	0.35937	0.19467
2	0.34079	-.04092	0.33414	0.18351
3	0.31511	-.02574	0.30890	0.17235
4	0.28942	-0.01057	0.28367	0.16118
5	0.26374	0.00461	0.25844	0.15002
6	0.23805	0.01979	0.23320	0.13886
7	0.21237	0.03496	0.20797	0.12769
8	0.18668	0.05014	0.18273	0.11653
9	0.16100	0.06532	0.15750	0.10537
10	0.13531	0.08049	0.13227	0.09420
11	0.10963	0.09567	0.10703	0.08304
12	0.08394	0.11085	0.08180	0.07188
13	0.05826	0.12602	0.05656	0.06071
14	0.03257	0.14120	0.03133	0.04955
15	0.00689	0.15637	0.00610	0.03839
16	-0.01880	0.17155	-0.01914	0.02722
Sum	3.17360	0.85237	3.10648	1.98099
t-Stat	(2.3518)	(0.5770)	(2.3538)	(3.3068)
AR(1)	0.57811	0.55397	0.57459	0.40863
S.E.	0.01852	0.02317	0.01821	0.01137
Adj-R ²	0.42888	0.48930	0.42632	0.40400
D-W	1.97733	1.98227	1.98631	2.12645

S.E. is the standard error of the regression. The critical t-statistic for the 5 percent significance level is 1.645.

growth. Indeed, significant positive correlation shows up only three years after the changes in the monetary base.

These results suggest that the Swiss National Bank can significantly influence the growth of M1, Divisia M1 and Divisia M2 through changes in the growth of the monetary base. Long-term simple-sum M2 growth, however, does not appear to be influenced by growth of the monetary base.

CONCLUSION

The relationship between the Swiss monetary base and inflation in Switzerland has become more uncertain in recent years. This phenomenon has generated considerable interest in using

broader monetary aggregates as monetary policy targets.

This paper examined the potential usefulness of Swiss M1 and M2 monetary aggregates compared with Swiss Divisia M1 and M2 aggregates derived from economic aggregation theory. We showed that M1 and Divisia M1 generally displayed similar movements over time and were related similarly both to Swiss inflation (which justifies their potential usefulness as a target) and to the monetary base (which means that their growth was potentially controllable by the Swiss National Bank).

M2 and Divisia M2, however, displayed substantially different behavior over time and, at certain key times, yielded substantially different signals about the stance of monetary policy.

More importantly, M2 growth was statistically unrelated to the growth of the monetary base.

The results suggest that M1, Divisia M1 and Divisia M2 would be suitable for further study if the Swiss National Bank is interested in the possibility of using broader monetary aggregates to replace monetary base targeting. However, these results indicate that M2 is unlikely to provide an adequate substitute for monetary policy purposes.

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Appendix 1 Divisia Indexes

There are two types of Divisia index numbers: the continuous-time version and the discrete-time version. Continuous-time Divisia index numbers are derived from microeconomic theory; discrete-time Divisia index numbers are approximations of the continuous-time version.

To understand how continuous-time Divisia index numbers are derived, consider the case where economic agents want a measure that aggregates a group of n commodities in the economy. The quantities of the goods are expressed by the vector $q=(q_1, q_2, \dots, q_n)$; their corresponding prices are denoted by the vector $p=(p_1, p_2, \dots, p_n)$. Economic aggregation theory states that the aggregator function is a utility function $g(q)$ to be maximized subject to the budget constraint,

$$(1) \sum_{i=1}^n q_i p_i = g(q) f(p) = E,$$

where $f(p)$ is the price aggregator function and E is the total expenditure on the specific goods. The

first-order necessary condition for utility maximization is

$$(2) dg(q)/dq_i = \lambda p_i,$$

where λ is the Lagrange multiplier. Because the aggregator function is linear homogeneous, Euler's equation is satisfied such that

$$(3) \sum_{i=1}^n (dg/dq_i) q_i = g(q).$$

Substituting equation 2 into equation 3 yields

$$\lambda \sum_{i=1}^n q_i p_i = g(q) \text{ and}$$

$$\lambda E = g(q).$$

Hence, $\lambda = g(q)/E$ and

$$(4) dg(q)/dq_i = p_i g(q)/E.$$

Taking the total differential of the aggregator function $g(q)$ yields

$$(5) dg(q) = \sum_{i=1}^n (dg/dq_i)dq_i$$

Thus, substituting equation 4 into 5 yields

$$(6) dg(q) = \sum_{i=1}^n p_i dq_i g(q)/E \text{ and}$$

$$dg(q)/g(q) = \sum_{i=1}^n p_i dq_i / E q_i.$$

If we set $S_i = p_i q_i / E$ and call it the i -th good's value share in the total expenditure, equation 6 can be transformed into

$$(7) d(\ln(g(q))) = \sum_{i=1}^n S_i d(\ln(q_i)).$$

Solving equation 7 for $g(t)$ yields

$$(8) g(t) = \text{EXP} \int \left(\sum_{i=1}^n S_i(t) d[\ln(q_i(t))] \right) dt.$$

Equation 8 is the continuous-time Divisia index.

Because economic variables are observed and measured in discrete time rather than continuous

time, the continuous-time Divisia index must be transformed into a discrete-time version to make it useful. The discrete time approximation of equation 7 is

$$(9) \ln(g(t)) - \ln(g(t-1)) = \sum_{i=1}^n S_{it}^* [\ln(q_i(t)) - \ln(q_i(t-1))]$$

or

$$(10) g(t) = g(t-1) \text{EXP} \left(\sum_{i=1}^n S_{it}^* [\ln(q_i(t)) - \ln(q_i(t-1))] \right),$$

where $S_{it}^* = (S_{it} + S_{it-1})/2$,

$$S_{it} = p_i q_i / E = p_i q_i / \left(\sum_{i=1}^n p_i q_i \right),$$

and S_{it}^* is the average expenditure share in the two adjacent time periods. Equations 9 and 10 are the discrete-time Divisia index equations used in calculating the Swiss Divisia M1 and M2 monetary aggregates.

Appendix 2 Data

To calculate the Swiss Divisia M1 and M2 monetary services indexes, we used the seasonally adjusted monthly Swiss M1 and M2 series and their components consistent with the definitions established in 1975 and incorporating the revision that occurred in 1985 (for more details, see *Schweizerische Nationalbank*, 1985).

The monetary aggregates consist of the following assets held by individuals and non-bank institutions:

- M1: Currency in circulation (C)
Demand deposits with banks (DB)
Demand deposits with the postal giro system (DP)
- M2: M1 plus time-deposits (TD)
- MB: Seasonally adjusted monetary base, defined as the sum of banks reserves and banks notes in circulation.

Interest Rates

To compute the user costs of monetary assets, we need the assets' own rates of return, the benchmark rate of return and the cost-of-living index.

Own Rates

- C Zero
- DB 0.25 percent
- DP 1975:06 - 1989:04: Zero
1989:05 - 1989:12: 2 percent
- TD three-month rate on time-deposits with large banks (monthly average)

Cost-of-living Index

Monthly Swiss Consumer Price Index (CPI) calculated by the Federal Statistical Office (Bundesamt fuer Statistik).

Benchmark Rate

The highest rate in each period from the following interest rates: the secondary market yield on cantonal bonds, interest rates on cash certificates with the cantonal or large banks and short-term Euromarket-Swiss franc interest rates. Short-term rates became the benchmark rates during 1979:12 - 1982:04 and 1988:12 - 1989:12, when the Swiss yield curve was inverted.

Steven Russell

Steven Russell is an economist at the Federal Reserve Bank of St. Louis. Lynn Dietrich provided research assistance.

The U.S. Currency System: A Historical Perspective

THE USE OF CURRENCY in transactions is a regular part of our daily lives and a basic feature of our economic system. The importance of currency derives both from its obvious role in daily transactions and from the somewhat more subtle role of the *currency system* as the basis for our monetary and financial systems. The currency system is so fundamental to economic activity that we tend to give it little thought. Few of us would have an easy time imagining what alternative systems might be like or why they might be desirable. Indeed, it seems likely that most of us, if pressed, would offer the opinion that the present currency system is the only one that is feasible—or at least, the only one that is desirable.

This article has three purposes. The first is to define the term “currency” and explain the special importance of currency and the currency system to our economy. The second is to describe the U.S. currency system—the system that governs the forms, uses and roles of currency in the modern United States. This description will be preceded by a catalog of the forms currency has taken at various points in the past, so that the modern U.S. system emerges as a set of selections from a menu of choices provided by history. This procedure is intended to suggest that alternative menu selections were possible—that the currency system which actually evolved in the United States is not the only one that could have evolved. The article’s third and most ambitious purpose is to present a brief but comprehensive account of the historical

development of the U.S. currency system. This account focuses on the period before and during the Civil War.¹ Its primary goal is to provide the reader with historical context that may improve his understanding of the modern currency system.

The historical account has a second purpose, however. The development of the U.S. currency system is often characterized as a process of slow but steady advancement: older institutions and practices, having failed to meet the demands of their times, were replaced by more efficient successors. This “gradual progress” characterization implies that the modern currency system meets the needs of our economy more efficiently than could any of the alternatives suggested by history. The historical account is intended to help determine whether this characterization is valid, and whether relative efficiency conclusions should be based on it.

WHAT IS CURRENCY?

One approach to defining currency is to contrast it with something whose definition is closely related, but more familiar: money. Most people have been exposed at some point to an economist’s definition of money; it usually reads something like “things that serve as media of exchange” or “things that function as means of payment.” While all currency is money, all money is not currency. Currency can be defined as money which *circu-*

¹U.S. monetary history from the end of the Civil War through modern times has been chronicled quite extensively, notably by Friedman and Schwartz (1963). In addition, most of the key

decisions that determined the basic form of the U.S. currency system were arguably made before 1865.

lates, or passes from hand to hand. ("Circulation" was once commonly used as a synonym for currency.)

Formally, a type of money can be said to circulate if it usually passes in exchange from one person to another without third-party verification. One easy way to illustrate the difference between circulating and non-circulating money is to contrast dollar bills, which circulate, with checks, which do not.² A dollar bill may pass from one person to another many times in different transactions. The only people involved in each transaction are the buyer and seller. Transactions using checks require more complex arrangements. It is unusual for a check, written by one person in payment to another, to be offered in payment to a third person. Instead, the second person usually deposits the check in a bank account. His bank and the first person's bank then conduct a "clearing" transaction which, if successfully completed, validates the payment.³

In the modern United States, only dollar bills and coins, issued by agencies of the federal government, fit the definition of currency. Earlier in our history (and that of many other nations) the number of alternative types of currency was larger, and included items issued by private organizations. The next section presents a brief catalog of some of the varieties of currency that have existed in the past.

WHAT FORMS CAN CURRENCY TAKE?

Commodity Currency

The earliest forms of currency were *commodities* (widely traded goods). In colonial America, for

example, commodities such as wampum (colored beads), tobacco, wheat and rice were used as currency at different places and times.⁴ Gold and silver, the "precious metals," had attractive properties—portability, malleability and durability—which ultimately made them the currencies of choice in most early economies.

Coin Currency

As the volume of transactions involving gold and silver increased, people began to divide these metals into pieces of readily recognizable size and shape, called *coins*. The earliest coin-producing facilities (mints) seem to have been privately operated.⁵ In most countries, however, the government eventually took over coin production.

The rationale behind the government takeover may well have included the belief that government-issued coins would be more uniform, and more reliable, than their privately issued counterparts. Early governments, however, could have resolved problems of diversity and fraud by regulating private mints and inspecting private coins, in essentially the same way that governments have long regulated and inspected other industries.⁶ A more compelling reason for government coin monopolies, however, was the desire to earn revenue from *seigniorage*—from periodically shortweighting or debasing the currency.⁷ Unless a government had a coinage monopoly, its attempts to earn substantial revenues from seigniorage would have been frustrated as the public abandoned its coins in favor of those minted by its private competitors.

The prevalence of government currency monopolies gave rise to the twin concepts of a

²Strictly speaking, economists think of the accounts against which checks are drawn (the demand deposits) as money, rather than the checks themselves.

³Typically, a person who is offered a newly written check in payment (the second party) will ask the check-writer (the first party) to present identification and will record information from the identification presented. The second party will deposit the check in his bank account. His bank will "clear" the check by sending it to the bank against which it is drawn, and demanding payment in cash. The two banks are the "third parties" which are actually involved in most transactions using checks. The clearing transaction is necessary to verify that the check is drawn on an account that contains sufficient funds. If the check "bounces," it has failed the verification test. The amount of the check will *not* be credited to the second party's account, and he will use the information from the check-writer's ID to pursue him for some alternative form of payment. [The reason the second party will rarely try to pass the check along to a third party is that the third party is unlikely to accept it. (If you doubt this, try passing such a "third-party check" at your local grocery store.) A third party

typically has no easy way of obtaining reliable identification from the (absent) first party.]

⁴For an extended discussion of the role of commodity money in the colonies, see Nettels (1934), chapter VIII.

⁵Feaveareyear (1963) describes early English currency as follows: "At the beginning of the eighth century the currency consisted of small silver coins varying in design according to the fancy of the individual moneyer." (p. 7)

⁶Adam Smith (1776/1937) points out that before coins evolved, governments often stamped ingots of precious metal to certify their purity (pp. 24-25).

⁷A coin is said to have been "shortweighted" if it is minted with less than its official metallic weight, but represented as having exactly that weight. A coin is said to have been "debased" if it is minted as a mixture of genuine monetary metal and common scrap metal, but represented as pure monetary metal. These fraudulent practices were sometimes practiced by private mints as well. For a discussion of government seigniorage motives, see Timberlake (1991), pp. 3-5, 50-51.

national currency and a national monetary unit. Typically, a government would define a basic monetary unit as a fixed quantity of gold or silver. It would then mint coins in *denominations* that were multiples or fractions of this unit and were scaled appropriately in size and weight.

Most nations had an extended period during which government-issued coins were the only form of currency. One problem with these pure-coin currency systems was that they had difficulty handling transactions of widely differing scales. If, for example, coins were denominated so that a single coin of moderate weight could be used to purchase an inexpensive item (say, an apple), then the coins necessary to purchase an expensive item (say, a carriage) were necessarily quite heavy. One common way in which governments tried to solve this problem was by establishing *bimetallic* coinage systems. In these systems coins of low value contained a relatively inexpensive metal (typically silver), while larger-value coins were composed of a more expensive metal (typically gold). The two types of coins were referred to collectively as *specie*.

The U.S. experience with specie currency illustrates most of the concepts just described. The U.S. Constitution gave Congress the power to “coin money, and regulate the value thereof”—a provision which has been universally interpreted as prohibiting the states either from minting coins directly or from authorizing private parties to do so.⁸ Shortly after the Constitution was ratified, Congress enacted legislation that defined the basic monetary unit, the *dollar*, as either a fixed weight of gold or a (different) fixed weight of silver. The federal government then opened a mint that produced dollar coins in accordance with these definitions. The mint also produced silver “quarters” containing one-fourth the amount of silver in a silver dollar, five-dollar gold pieces containing five times the amount of gold in a gold dollar, and so on.⁹ The U.S. Mint continued to produce full-bodied gold coins until the early 1930s, and full-bodied silver coins until the mid-1960s. (A full-bodied coin contains a quantity of metal whose market value is equal to the face value of the coin.)

As the magnitude of economic activity increased, the weight of the gold coins necessary for a major purchase, or even the quantity that a relatively wealthy person might desire to have on hand, became unmanageably large. Coins also tended to wear away or have their edges clipped. After a few years, coins of the same denomination could be significantly different in size.¹⁰ These problems made coins increasingly unsatisfactory, even for relatively small-scale transactions.

Bills of Exchange

An obvious solution to the “weight problems” of the coin currency system was to find or create lightweight objects that, while not made of coins themselves, had known values in terms of coins. Objects like this already existed: they were *promissory notes*—contracts between borrowers and lenders calling for the repayment of fixed sums (in coin) at fixed future dates.

One special type of promissory note, the *bill of exchange*, was readily adapted for use as currency. Bills of exchange grew out of commercial transactions in which merchants would arrange to purchase goods from other merchants for delivery at fixed future dates (for example, in 90 days). Often the seller could not afford to produce and/or deliver the goods unless he received immediate payment, while the buyer was reluctant to pay for the goods before receiving delivery. One solution to this problem was an exchange of contracts. The seller would contract to deliver the goods at the date in question, while the buyer would contract to pay the purchase price at the delivery date. The latter contract took the form of a conventional promissory note.

This exchange of contracts may not seem to have addressed the seller’s immediate problem: to obtain the currency needed to finance the production and/or transport of his goods. Suppose, however, that the seller, armed with his promissory note, sought to purchase materials from a supplier. He could then write out another credit instrument—a bill of exchange—calling on the merchant who had issued the promissory note to pay the supplier the purchase price of the materials, plus an allowance for interest, in 90

⁸U.S. Constitution, Article I, Section 8.

⁹See Huntington and Mawhinney (1910), pp. 474-79. Gold dollar coins were not actually minted until 1849. See Carothers (1930), pp. 105, 109, and Huntington and Mawhinney (1910), pp. 508-09.

¹⁰For a description of the clipping problem in pre-eighteenth century England, see Feavearyear (1963), pp. 5-6, and Macaulay (1877), volume V, pp. 85-93.

days. This process was called *drawing* a bill; the original goods seller was called the *drawer* and the issuer of the promissory note the *drawee*. The drawee would *accept* (agree to cover) the bill as long as its value was less than that of the promissory note. He would indicate his acceptance by endorsing the bill.¹¹

By accepting the bill, the supplier was, in effect, lending the seller the value of the materials the latter had “purchased.” The supplier, however, usually did not expect to hold the bill until it came due. Instead, he planned to pass it along to someone from whom he wished to purchase goods; this person might pass it along to someone else, and so on, until the bill matured. The last person in the chain would demand payment from the drawee. In between, the bill served as paper currency.¹²

Notice that drawing a bill was analogous to writing a check, with the drawee of the bill playing the same role as that of a bank on which a check is drawn. It seems to follow that bills of exchange should not have circulated, for precisely the same reasons that modern checks do not circulate. There was a basic difference between a bill of exchange and a modern personal check, however. Because no one would accept a bill unless it was endorsed by the relevant drawee, the question of “bad checks”—checks written by individuals with insufficient funds—did not arise. Stated differently, an accepted bill was purely a liability of the drawee; a person offered a bill in payment did not need to be concerned about the creditworthiness of the drawer.¹³

It is true that bills were occasionally *dishonored* by their drawees, just as modern banks occasionally fail.¹⁴ As long as the bills were drawn against well-known merchants with established reputations in commerce, however, failures were uncommon. Consequently a person who accepted a bill in payment could be reasonably confident

that, if he did not have occasion to pass it along, he could redeem it when it came due.¹⁵

Although bills of exchange became an important adjunct to coin currency, a number of problems limited their usefulness. Since they were typically drawn in fairly large denominations (of the sort appropriate for trade between merchants), they were not well suited for small-scale transactions. And, as the volume of trade in a given region increased, it became less and less likely that a person proffered a bill would be familiar, either personally or by reputation, with the merchant against whom it was drawn. Consequently, dishonored bills became a more serious problem, and people became hesitant to accept them in payment. A less fundamental, but still annoying, problem was that whenever a bill changed hands, interest had to be calculated and deducted from its face value. This fairly involved calculation required consideration of both the remaining term on the bill and the market rate of interest.

Bank Notes

The transactions problems with bills of exchange created opportunities for private entrepreneurs to profit by providing paper currency in more convenient forms. Suppose an enterprising merchant with a good reputation sold small bills of exchange in return for specie and used the proceeds to buy large bills with the same maturity dates. The proceeds of the large bills would then provide a fund out of which the small bills could be redeemed. Because small bills were much more convenient for exchange purposes than large bills, they were slightly more valuable, per dollar of face value, to their holders.¹⁶ As a result, small bills could be sold at smaller percentage discounts (lower interest rates) than large bills. It followed that the total purchase price of the large bills necessary to cover a given face value of small bills was smaller than the total sale price of the small bills. This difference in total prices represented the merchant's profits.

¹¹See Clough and Cole (1941), pp. 77-78.

¹²In England, bills of exchange played a prominent role as means of payment during the seventeenth and eighteenth centuries; see Feavearyear (1963), pp. 160-62. In several English districts, they retained this role well into the nineteenth century; see Clapham (1944), II, pp. 90-91, 97-98, Viner (1937), p. 123, and Feavearyear (1963), p. 165.

¹³It is worth noting that while it is usually difficult to negotiate a third-party check drawn on an individual's bank account, a check drawn on the account of a government agency or prominent local corporation may be easy to negotiate.

¹⁴The existence of federal deposit insurance prevents small-scale personal depositors from being endangered by bank failures. Before 1935, however, this was not true.

¹⁵Contemporary criminals sometimes forged merchants' acceptances, just as modern criminals sometimes forge checks. The severity of penalties for forgery limited the scale of this problem, however.

¹⁶For a careful description of the logic behind this statement, see Wallace (1983).

The merchant had now become a *banker*, and the institution he operated a *bank of issue*—a financial intermediary whose liabilities consisted primarily of paper currency.¹⁷ The small bills came to be known as *bank notes*.

The merchant could increase his profits from note issue by reducing the risk that he would default on his notes. This would reduce the “risk premium” that small billholders demanded, and enable him to sell the bills at smaller discounts. One strategy for accomplishing this was to diversify his large bill portfolio as extensively as possible. Another was to provide, or to obtain from investors, some capital to act as a cushion against defaults on the large bills.

A basic problem with the scheme just described was that the time and effort necessary to compute the appropriate discount on a bank note was usually large relative to the face value of the note. This reduced the usefulness of notes in transactions and discouraged people from purchasing them.¹⁸ One way to solve this problem was to issue notes with characteristics so appealing that their holders would be willing to forgo interest on them. How could this be accomplished?

Since we have assumed (perhaps too quickly) that proper diversification and capitalization made the risk on bank notes negligible, the need for interest on them arose purely out of their holders’ *time preference*—their desire to be compensated for giving up their money (in this case, their specie currency) for fixed periods. Suppose, however, that a merchant promised to redeem his notes on *demand* (at any time) instead of at a fixed future date. Since the purchaser of such notes could reclaim his specie whenever he chose, he would not be giving it up for any fixed period, and would have no reason to demand interest. The bills could then be sold *at par* (undiscounted).

How could a merchant make such a *convertibility* commitment credible? Clearly, he would need to hold back some of the (specie) proceeds of his note sales for use as *reserves*. These reserves would not have to be large, however, because as long as noteholders were confident that they *could* redeem

their notes, there was no particular reason why they *would* do so. After all, the holders had bought the notes because they were more convenient for exchange purposes than specie.

Notice that there is some circularity in the argument just presented. Convertibility, it asserts, was necessary to prevent noteholders from demanding compensation for giving up their specie, which they had been holding for use as money. But these people had exchanged their specie for notes precisely because the notes were a more convenient form of money! This paradox makes it seem possible that convertibility is not really necessary; indeed, there are both historical and theoretical reasons for suspecting that it may not be. In practice, however, the vast majority of private banks of issue have attached convertibility commitments to their notes.¹⁹ The Bank of England, for example, began circulating convertible notes shortly after it received a royal charter in 1695. These notes became the principal paper currency of the relatively developed region surrounding London (the “Metropolis”).²⁰

Government Paper Currency

Governments eventually acquired a role in the paper currency system by regulating the issuance of private paper currency, and/or by issuing paper currency directly. The motives for this decision were essentially the same as those which drove governments to acquire a monopoly over coinage: some combination of a desire to improve efficiency by facilitating the development of uniform and reliable paper money, and a desire to earn revenue by regulating or replacing the private banking system. This revenue has been earned in a variety of ways. In some cases, governments have earned substantial sums by granting private institutions the right to issue paper currency in return for some kind of financial consideration. (See, for example, the discussion of the establishment of the Bank of England which appears below.) In other cases, revenue has been earned through direct currency seigniorage, in which the government issues paper currency to purchase goods and services, or through indirect seig-

¹⁷For a description of banks that dealt in bills of exchange, see Feavearyear (1963), pp. 162-65.

¹⁸White (1987) provides an analysis of the transactions problems associated with interest-bearing currency.

¹⁹Calomiris and Kahn (1991) construct a formal model in which note- or deposit-holders can use redemption demands as a device for preventing bank frauding by forcing a preemptive

liquidation. Incomplete information problems make it impossible for these agents to detect fraud without a liquidation. While this model is not reasonable in every historical context, it represents a first step toward explaining the prevalence of convertibility.

²⁰For the early history of the Bank of England, see Clapham (1944), volume I.

niorage, in which the government issues paper currency to purchase and retire its own bonds.

Government paper currency can take a variety of forms. The earliest form of government paper currency—and until quite recently, the most common form—was *representative currency*. A government currency is said to be “representative” if it is issued under a convertibility commitment; that is, a government promise to redeem the currency in specie, at par and on demand. Representative currencies are the government-issued analogues to private, convertible bank notes. While they have usually been issued by government-organized “central banks,” they have sometimes been issued directly by the government. The United States, for instance, had directly issued representative currency during 1879-1913 (the U.S. notes, or “greenbacks,” which were issued by the Treasury) and representative currency issued by a central bank during 1914-1933 (the Federal Reserve notes, which were issued by the Federal Reserve Banks).²¹

Governments have also issued currency that is *not* convertible into specie, or anything else. This type of currency is often referred to as *fiat currency*.²² During the Civil War, both the Union and the Confederacy issued fiat currency to finance part of their military purchases. The Union currency was the greenback mentioned above. Modern U.S. currency is also fiat in nature. Federal Reserve notes (our dollar bills) have not been convertible for domestic holders since 1933; since 1971, they have not been convertible for any holders whatsoever. The Federal Reserve Banks

issue most of these notes in purchase of U.S. Treasury securities.²³

WHAT IS A CURRENCY SYSTEM?

A nation's *currency system* can be defined as the set of laws, conventions and practices that determine the form and role of currency in the nation's economy. A complete description of a nation's currency system would provide answers to questions like: “What things does the economy of this nation use as currency?”, “What sorts of institutions (private and/or government) are permitted to issue currency under the nation's laws?”, “What role (if any) does the nation's government play in defining the economy's currency unit, or in preserving its value?”, and “What is the nature of the relationship between the nation's currency system and its monetary and financial systems?”

HOW DOES THE U.S. CURRENCY SYSTEM WORK?

This section will provide a brief summary of the history and legal framework of the U.S. currency system. It will focus on a pair of legal restrictions that play a critical role in shaping the system. These restrictions would be prime candidates for revision or repeal if the system were to be reformed or deregulated.

As previously noted, the U.S. Constitution gave Congress exclusive power to define a national monetary unit and produce coined currency. In addition, the states were explicitly prohibited from issuing paper currency directly.²⁴ The

²¹The greenbacks were first issued in 1863, but were not convertible until 1879. Federal Reserve notes were convertible for domestic holders from the establishment of the Federal Reserve System in 1914 until March 1933. They remained convertible for certain foreign holders until 1971.

²²A distinction is sometimes made between inconvertible government currencies that are issued in purchase of assets (and so form the liabilities side of a “balanced” balance sheet), and currencies which are issued in purchase of goods and/or services. Currencies of the former type are referred to as *fiduciary*. Many economists believe that currencies derive much of their value from the assets which back them. Descriptions of this view appear in Smith (1985b) and Russell (1989a). It suggests that fiduciary currencies may be less likely to decline in value (that is, to *depreciate*) than fiat currencies.

²³Strictly speaking, the Federal Reserve System pays for the Treasury securities it purchases by issuing claims on the Federal Reserve Banks. These claims can be redeemed in currency—Federal Reserve notes—which can be held by the general public as cash balances, or by commercial banks as reserves. Alternatively, the claims can be converted into demand deposits at the Federal Reserve Banks, which can

also be used by commercial banks as reserves. The decision concerning how the claims are divided between these competing uses is made by the private sector.

At present, currency held by the public, or as reserves, accounts for about 85 percent of total claims on the Federal Reserve Banks, while U.S. Treasury securities account for about 75 percent of their total assets. In addition, the economic implications of the scheme for paying for these securities just described are identical to those of an alternative scheme under which the System paid for Treasury securities with newly issued Federal Reserve notes, and the private sector decided how much of this currency to retain and how much to deposit with the Reserve Banks.

The Federal Reserve Act prohibits the System from purchasing newly issued Treasury securities—an action that would amount to issuing currency (and/or Reserve Bank deposits) to finance government purchases. [See the definition of “indirect currency seigniorage” presented earlier in this section.]

²⁴Article I, Section 10 of the U.S. Constitution denies the states the power to “emit Bills of Credit;” this was almost universally understood to prohibit them from issuing their own currency.

Constitution was silent, however, on two questions that ultimately became controversial: Does the federal government have the right to issue paper currency? Do either the federal government or the states have the right to authorize private institutions to issue paper currency—do they have the right, that is, to grant charters to private banks?

Shortly after the Constitution was ratified, the states began to charter private banks of issue.²⁵ In 1791, and again in 1816, the federal government chartered a single private bank—the Bank of the United States. For the next three-quarters of a century, the bulk of the paper currency that circulated in the U.S. was issued by state banks; virtually all of the remainder was issued by the United States Bank. The rights of the federal government and the states to charter private banks were eventually affirmed (in separate decisions) by the U.S. Supreme Court.²⁶

In 1865, Congress imposed a tax on note issue by state banks that was high enough to make the activity unprofitable. This action, which came one year after Congress had established a system of federally chartered banks of issue called the National Banking System, was evidently intended to put an end to state banking.²⁷ Another wartime innovation was the issuance, beginning in 1862, of “greenbacks.” For the next 50 years, the U.S. stock of paper currency consisted almost entirely of national bank notes and greenbacks.²⁸

The Civil War produced a dramatic expansion of the federal government’s role in, and powers over, the U.S. monetary system. In the years immediately following the war, the right of the federal government to play this role, and to exercise these expanded powers, was affirmed in a series of

Supreme Court decisions. The war converted a political system in which the monetary powers of federal government were sharply circumscribed into one in which they were virtually unlimited.

Almost half a century later, the federal government’s monetary powers were wielded in dramatic fashion when Congress passed the Federal Reserve Act of 1913. This legislation established 12 “Federal Reserve Banks” that collectively constituted a “central bank” for the United States.²⁹ The Reserve Banks issued a new form of representative paper currency called “Federal Reserve notes.” These notes became the basis for the U.S. currency system.

During the first two decades following the passage of the Federal Reserve Act, the national banks retained the right to issue limited quantities of notes. In 1935, however, the national banks’ issue rights expired; Congress declined to renew them, and made provisions for the gradual retirement of all national bank notes still outstanding.³⁰ Since 1935, the Federal Reserve Banks have been the only U.S. organizations authorized to issue paper currency on a regular basis.³¹

The result of this historical process can be summarized as the first of two basic legal restrictions which govern the U.S. currency system: the federal government has a *legal monopoly* over the issuance of currency, whether in coin or paper form.

The second basic legal restriction involves the relationship between currency, which is now exclusively federally issued, and “money” of other sorts, which continues to be provided by the private sector. Privately issued money is required to be convertible (redeemable at par and on

²⁵For an exhaustive list of banks chartered by the states prior to 1837, see Fenstermaker (1965).

²⁶Key decisions upholding the right of the states to charter banks are *Craig v. Missouri* (1830) and *Briscoe v. the Bank of the Commonwealth of Kentucky* (1837). Key decisions regarding the right of the federal government to charter banks are *McCulloch v. Maryland* (1819) and *Farmers and Mechanics Bank v. Dearing* (1875).

²⁷State banking survived because it proved possible for many state banks to convert to pure deposit banking, which was not taxed prohibitively.

²⁸They were eventually supplemented by substantial quantities of silver certificates, and by minor quantities of federal govern-

ment currency of other sorts. See Friedman and Schwartz (1963), pp. 124-34, and Timberlake (1978), chapter 10.

²⁹The text of the act appears in the *Annual Report of the Federal Reserve System* for 1914.

³⁰See Friedman and Schwartz (1963), p. 442.

³¹In principle, Congress retains the right to authorize the Treasury to issue paper currency directly. It has declined to do so, however, since the establishment of the Federal Reserve System.

demand) in government currency.³² In practice, privately issued money consists of deposits at commercial banks and thrift institutions that are potentially convenient as media of exchange—i.e., that are readily transferable (checkable) and available in small denominations. The government requires that these deposits be convertible, and they are referred to as “demand deposits.”

If demand deposits are to be convertible into government currency, they must be denominated in the same units, and have the same market value per unit, as government currency. Consequently, the convertibility restriction, combined with the government’s currency monopoly, imposes a common denominational and value standard on all U.S. money. The denominational standard is of course the “dollar,” the basic unit of government currency; the value standard is the purchasing power of a dollar (or any fixed number of dollars) of this currency.

It is worth noting that governments usually attempt to enhance the acceptability of their currency by making it *legal tender*. Legal tender laws either require or strongly encourage people to accept government currency in payment of *nominal* debts—debts denominated in national currency units. In the United States, both coins minted by the Treasury and Federal Reserve notes are legal tender.

HOW DID THE MODERN U.S. CURRENCY SYSTEM DEVELOP?

Science has been slow to admit the different explanatory world of history into its domain—and our interpretations have been impoverished by this omission. Science has also tended to denigrate history, when forced to a confrontation, by regarding any invocation of contingency as less elegant or less meaningful than explanations based directly on timeless “laws of nature.”

—Stephen Jay Gould (1989).

English Origins

Synopsis: The origins of the modern U.S. currency system can be traced in large part to England. Many important features of the U.S. currency system were based on English models. The early history of paper currency in England was dominated by the government’s need for specie revenues to finance its foreign wars. This need caused the government to establish two principles—Bank of England monopoly, and strict specie convertibility—as the basis for England’s system of paper currency. These principles had a profound effect on the evolution of paper currency and banking in the United Kingdom, and later in the United States.

In England, the notion of organized note issue seems to have arisen during the latter part of the seventeenth century. At the time, England had had a government-monopoly coin currency system for several centuries, and had begun to develop a paper currency system based on bills of exchange.³³ During the last decade of the seventeenth century several groups of entrepreneurs recognized an opportunity to profit by providing a more convenient paper currency. Each of these groups sought royal charters for banks of issue.

Horsefield (1960) singles out four groups for special study. One of them, led by William Paterson, proposed a bank which would lend convertible notes on commercial security. The new bank was called the Bank of England. It received a charter in 1695, and has operated continuously since; it is now the central bank of the United Kingdom.³⁴

Three other groups, led by Hugh Chamberlen, John Briscoe, and John Asgill and Nicholas Barbon, respectively, proposed “land banks” which would lend inconvertible notes on the security of land and other real property. The land banks of Briscoe and Asgill-Barbon actually operated for a short time during 1695-96. In the latter year, they were consolidated pursuant to a scheme to secure a royal charter by raising £2,000,000 in specie to be lent to the British government, which was des-

³²During the earliest decades of U.S. banking history, the convertibility requirement was largely implicit. Early in the nineteenth century, however, states began to pass legislation which explicitly imposed convertibility on the banks—or, alternatively, to include convertibility requirements in bank charters. The federally chartered United States Banks had convertibility requirements in their charters. Convertibility requirements were standard features of state charters issued under the “Free Banking” laws of 1836-63. The federal

charters issued during the late nineteenth century, under the National Banking Act, also included convertibility requirements.

³³For a description of early English monetary history, see Feavearyear (1963), chapters I-IV.

³⁴The definitive history of the Bank of England has been written by Sir John Clapham (1944, two volumes).

perate for funds. The charter of this “National Land Bank” required that it raise half of the specie loan prior to beginning operation. When it proved unable to do this, the charter lapsed and the scheme fell apart.³⁵

The fear that a public accustomed to coin currency would not accept inconvertible notes certainly played a role in the collapse of the National Land Bank and other land bank schemes. Nevertheless, even Horsefield (1960), who is generally unsympathetic to the concept of land banking, points out that “the major cause of these events was an accident of time.”³⁶ The Bank of England, which had obtained its charter by means of a similar commitment to provide specie, had drained the capital market of funds. This problem was exacerbated by the onset of a commercial crisis, which forced the Bank of England to suspend specie convertibility of its notes.³⁷

In 1697 the Bank of England obtained, in return for a further extension of credit to the government, a formal commitment that Parliament would authorize no other banks so long as the Bank existed. Its urgent desire for this commitment suggests that it continued to regard land banking as a viable competitive threat. Clapham (1944) writes that “the General Court [the directors of the Bank of England] wanted no more Land Banks.”³⁸ In 1708, in return for further loan commitments, the monopoly grant was “reenacted and made more precise.” Parliament explicitly prohibited any firm consisting of more than six partners from issuing notes in England.³⁹ Thereafter English note issue was dominated by the Bank of England. The small “country banks” operated in

its shadow, and evolved along strictly convertible lines.⁴⁰

The development of the British currency system can be properly understood only in the context of the symbiotic relationship between the British government and the Bank of England.⁴¹ The Bank regarded its paper currency monopoly as critical to its profitability, and was willing to make large financial concessions to the British government in order to protect and extend it. The British government, on the other hand, was willing to grant the Bank a monopoly because it needed the Bank’s financial assistance—in particular, to help it obtain specie to finance foreign wars.⁴² Under the circumstances, it was profoundly in the interest of both parties for government liabilities to be identified as closely as possible with Bank liabilities, and for Bank liabilities to be identified as closely as possible with specie.⁴³ The simplest and most certain way to achieve this was for the Bank to lend extensively to the government and make its notes strictly convertible.⁴⁴

In Scotland the situation was quite different. The convertible, commercial Bank of Scotland was chartered by the Scottish Parliament in 1695. This bank, unlike the Bank of England, was statutorily uninvolved in government finance. It was granted a 21-year note issue monopoly (which was not renewed). In 1705, both Hugh Chamberlen, who had now moved to Scotland, and John Law, who was later to achieve monetary infamy in France, proposed land banks for Scotland. Both proposals were rejected because they involved notes that were legal tender—a status Parliament was unwilling

³⁵See Horsefield (1960), chapters 14-16, and Clapham (1944), volume I, pp. 33-34.

³⁶Horsefield (1960), p. 246.

³⁷Ibid., pp. 246-47.

³⁸Clapham (1944), vol. 1, p. 47.

³⁹See Clapham (1944), p. 65, and Feavearyear (1963), pp. 167-68.

⁴⁰During 1797-1821 (the era of the Napoleonic Wars), the Bank of England suspended specie payments. Although its notes were not officially legal tender, they became so operationally. Specie virtually disappeared from circulation, most payments were made in Bank of England notes, and other English banks redeemed their notes in Bank of England notes. See Feavearyear (1963), pp. 182-85, and Viner (1937), p. 154.

⁴¹Macaulay (1877) provides a colorful and illuminating paragraph describing this relationship (IV, pp. 551-2).

⁴²Clapham (1944), describing the Bank’s first summer, observes that “what the government—like the Bank—most

wanted in the summer of 1696 was not a circulation of notes but cash, hard cash for the Army in Flanders” (vol. 1, p. 39).

⁴³Clapham (1944) points out that under the Act of 1697, which formalized the Bank’s monopoly, “forgery of the Bank’s notes was to be punished with death, the penalty for clipping or coining the King’s money. Bank notes were not yet the King’s money, but they were getting near to it.” (vol. 1, p. 50). In October of 1698, he writes, the English Treasury agreed to “‘receive such bills of the Bank of England commonly called Bank Bills ... provided the said bills are not at any discount.’ The time was getting nearer when the Bank would circulate the Exchequer Bills for the Treasury, cash them on demand, accept them as deposits, make generous advances on their security, and even pay a dividend on them.” (vol. 1, p. 56; my emphasis). And in 1710, just two years after it had acted to further strengthen the Bank’s monopoly status, the British Parliament passed an Act “‘for engaging and obliging the Bank of England ... to exchange all Exchequer bills for ready money on demand.’” (vol. 1, p. 67).

⁴⁴Santoni (1984) asserts that “the Bank’s contract with its customers to redeem its notes at a fixed price in terms of gold

to grant private liabilities.⁴⁵ Apparently, the failure of the English land bank schemes had created a belief that inconvertible notes would be accepted only if they were legal tender. As we shall see, this belief was also widespread in the American colonies—where experience ultimately refuted it.

During the eighteenth and early nineteenth centuries, Scottish banking was considerably more competitive than English banking. The major banks fought bitter “note duels,” presenting their competitors’ notes for payment in an effort to drain their specie reserves and force them to retrench. One defensive response to these duels was the issuance by Scottish banks of notes which contained an “option clause”—a clause that granted them the right to defer specie payments for a fixed period in return for legal interest.⁴⁶

Experiments like the option clause might well have led to further departures from convertibility in Scotland, where both the public and the government were more comfortable with banks and paper currency than their counterparts in England. During the financially troubled years of the early 1760s, however, the option clause and other “irregular” Scottish banking practices attracted unfavorable attention in England (whose Parliament had absorbed that of Scot-

land in 1707). In 1765 the British Parliament stepped in with an act prohibiting notes containing an option clause, or any other departures from strict convertibility.⁴⁷

Colonial Origins

Synopsis: The American colonies experimented with a variety of currency systems based on inconvertible notes issued by colonial governments. During the early eighteenth century the British government began to regulate these systems. British regulation forced some of the colonies to back their notes more carefully, and eventually prevented all the colonies from making their notes legal tender. By the end of the colonial period many of the colonies had developed successful and popular currency systems. These systems were based on inconvertible notes which were carefully backed, and were not legal tender.

Conditions in early colonial America differed from those in England even more profoundly than did conditions in Scotland. In the colonies, the most pressing monetary problem was a specie shortage: the quantity of specie the colonists were able to retain seems to have been insufficient to meet their

was a voluntary arrangement” (p. 15). He justifies this assertion by noting that the gold standard was not imposed by British law until 1821, more than a century after the Bank was founded. While this is certainly true, it is also true that until the early nineteenth century much of British bank regulation was implicit rather than explicit. One illustrative example involves the monopoly status of the Bank of England. Most historians describe the Bank as having possessed a monopoly over joint-stock (corporate) banking in England. However, the Act of 1708 gave it a monopoly only over joint-stock *note issue*. Nevertheless, none of the deposit banks in England attempted to organize in corporate form. Feavearyear (1963) explains this by noting that, despite the lack of an explicit legal prohibition against joint-stock deposit banking, “there can be no question whatever that the intention was to give the Bank of England a monopoly of joint-stock banking, and that had any other institution of more than six partners attempted to carry on banking in England in any manner whatever at any time during the first half of the century it would have been suppressed” (pp. 167-68). Similarly, despite the lack of an explicit legal requirement that bank notes be convertible, there can be little question but that the intention was that they should be convertible, and that any attempts by the Bank of England, or any of the English country banks, to issue inconvertible or semiconvertible notes would have been suppressed—just as attempts of this sort by Scottish banks were suppressed (see below).

Santoni also asserts that the establishment of an official gold standard occurred as a result of “the Bank’s continuous prods to an unwilling government.” He justifies this assertion by noting (1) that the deadlines set by Parliament for resump-

tion were repeatedly postponed, and (2) that the Bank resumed paying specie for small notes in 1817, and Parliament intervened in 1819 to prohibit it from doing so. However, Viner (1937), Clapham (1944), and Feavearyear all report that the government’s primary goal in postponing resumption was to avoid embarrassing the Bank. [Viner writes that “the government continued to refuse to obligate the Bank of England to resume cash payments, and *both government and Bank* were obviously waiting for the course of events to disclose the auspicious occasion for resumption” (p. 172, my emphasis); Feavearyear notes that “the Government refused to allow the Bank’s hand to be forced, and repeatedly extended the term of the Restriction Act” (p. 214).] These authors also describe the resumption attempt cited by Santoni as a failure, and the government prohibition as an attempt to protect the Bank. Finally, both Clapham (1944, vol.2, p. 70) and Feavearyear (pp. 221-22) report that the Bank opposed the legislation which actually compelled it to resume specie payments.

⁴⁵For a history of the early years of Scottish banking, see Checkland (1975) or White (1984). For a description of the Scottish land bank proposals and their fate, see Horsefield (1960), pp. 175-78, 215-16.

⁴⁶The option clause has attracted a good deal of academic attention in recent years. See White (1984), pp. 25-30, 141-42, Rockoff (1986) and Dowd (1988), for example.

⁴⁷See Checkland (1975), pp. 118-21; White (1984), pp. 29-30. The legislation originally proposed ruled out the option clause only; it was later amended to rule out any notes not redeemable on demand.

needs for a medium of exchange.⁴⁸ During the 1650s, the Massachusetts Bay Colony attempted to allay the shortage by operating its own mint (which produced the renowned “Pine Tree Shillings”). The British government viewed this action as usurping a royal prerogative, however, and forced Massachusetts to close the mint.⁴⁹ The colonies also experimented with commodity currencies of different types; these included wampum (Indian beads), rice and tobacco.⁵⁰

Despite the public’s need for more convenient means of payment, the introduction of a new form of government paper currency was motivated in the first instance by the fiscal exigencies of a colonial government. In 1696, the Massachusetts legislature experienced great difficulty financing an expedition against the French in Canada. It decided to issue “bills of credit” in the form of paper currency to use to purchase supplies. These bills were neither convertible nor ultimately redeemable in specie; they could, however, be used to defray future tax liabilities. This financing expedient proved quite successful, and the colony used it repeatedly during the ensuing 50 years. Within a very few years, other colonies began to adopt the practice—first in New England, and later elsewhere. By 1730 or so, bills of credit had become the principal currency of the American colonies.⁵¹

The earliest colonial bills were issued, like these Massachusetts bills, in anticipation of future taxes. After a few years, however, certain colonies began experimenting with bills that were issued on loan. Typically the issuing colony would pass laws providing that relatively small sums in new bills could be lent to individuals who were able to provide land or other sorts of property as collateral. (Often these loans were mortgage loans and were intended in part to encourage the colonists to settle and improve land.) These “loan office” or “land bank”

issues became increasingly popular during the first half of the eighteenth century.⁵²

As previously indicated, the legislation authorizing the emission of tax anticipation or loan office bills was typically accompanied by legislation providing for their eventual retirement—either by imposing future taxes which the bills could be used to pay, or setting out the terms according to which the loans would be secured and repaid. The legislators clearly believed that it was these retirement commitments that conveyed value to the bills.⁵³ Unfortunately, there were often great political and financial incentives for the colonies to violate these commitments by declining to levy or collect the future taxes, by declining to collect the loan payments, or by stretching out the period over which loans could be repaid. When these things happened, the bills would often depreciate in value relative to specie and goods.⁵⁴ The extent of the depreciation was typically measured by the discount on paper currency relative to specie currency; that is, by the difference, in percent, between unity (one) and a fraction equal to a given quantity of specie currency divided by the quantity of paper currency it could be sold for in the open market. If it took 50 shillings in paper currency to purchase 40 shillings in specie currency, for instance, then the discount on paper currency was 20 percent. During the early decades of the eighteenth century, many colonial currencies experienced significant depreciation. In some cases, the depreciation was quite severe.⁵⁵

Currency depreciation became particularly controversial because most colonies gave their bills of credit the status of *legal tender*. Legal tender laws compelled creditors to accept bills at face value in payment of debts. If, for example, a loan agreement called for a repayment of 500 shillings at the end of five years, the lender could be forced to accept 500 shillings in bills of credit,

⁴⁸For discussions of the specie shortage, see Nettels (1934), pp. 202-207, and Brock (1975), pp. 1-9.

⁴⁹See Felt (1839), Bullock (1900), Chapter III, Breckinridge (1903), pp. 55-56 and Nettels (1934), p. 276.

⁵⁰None of these experiments proved particularly satisfactory. For a description of colonial experiments with commodity currency see Nettels (1934), chapter VIII, and Brock (1975), pp. 9-16.

⁵¹For an encyclopedic account of colonial currency history prior to 1764, see Brock (1975).

⁵²For discussions of colonial land banking, see Davis (1900), Kemmerer (1939), Thayer (1953), Billias (1959), Brock (1975) and Smith (1984), among others.

⁵³Nettels (1934) writes that “In the opinion of the colonists, the principal factor affecting the specie value of their paper was the provision made for redeeming it from tax revenues” (pp. 257-58).

⁵⁴For analyses of the link between backing and depreciation, see Smith (1984, 1985a, 1985b) and Russell (1988).

⁵⁵Data on the specie prices of the currencies of various different colonies are presented by Brock (1975) and Smith (1984, 1985a, 1985b), among others.

even though he might prefer specie. The penalties for refusing to accept bills were relatively harsh: the creditor might forfeit the entire amount of the debt or, in some cases, a multiple thereof.⁵⁶

The original idea behind legal tender laws was to protect borrowers, and to reduce the frequency of lawsuits, by providing a method of repayment which was beyond legal challenge.⁵⁷ When unexpected depreciation occurred, however, legal tender laws tended to benefit debtors (by reducing the real value of their obligations) at creditors' expense. This made them popular with farmers and other debtors, and unpopular with creditor interests.

The creditor interests included a number of British merchants who did business with the colonies. Many of these merchants were well-connected in Great Britain; their complaints, which were seconded by those of indigenous merchants and creditors, received sympathetic attention from the British colonial administration, and eventually from the British Parliament. After 1730, the colonial administration began to issue regulations eliminating or restricting the right of particular colonies to issue new bills or (more frequently) to make them legal tender. As the problem of depreciation worsened, however, Parliament considered comprehensive legislation. The Currency Act of 1751 deprived the New England colonies of the right to issue legal tender bills and greatly restricted their powers to issue paper currency of any description. In 1764, a second Currency Act extended the legal tender prohibition to all the colonies.⁵⁸

Many colonies responded to the legal tender prohibitions by issuing non-legal tender bills of credit. Although many contemporary analysts believed that giving the bills legal tender status was essential to preserve their value, this does not seem to have been the case in practice.⁵⁹ The non-tender bills remained quite stable in value—far more stable, in many cases, than their legal tender predecessors. This was particularly striking because many non-tender issues took the form of land banks—a mode of issue the British regarded as particularly prone to depreciation.⁶⁰ During the decade prior to the Revolution, the colonies appeared to be moving toward a system of non-legal tender land bank currency.⁶¹

Revolution and Reorganization

Synopsis: The Revolution completely disrupted the evolution of the American currency system. The Continental Congress was forced to finance wartime expenditures by money creation—a policy which led to a virtual hyperinflation. The war, and the depression that followed it, produced financial problems for both state governments and the general public. One symptom of these problems was large public and private debts—many of which were held by the domestic propertied classes. This situation, combined with memories of the recent inflation, created fears among the members of these classes that popularly elected state governments would adopt monetary policies designed to partially repudiate these debts. Representatives of the propertied classes dominated the Constitutional convention. They moved

⁵⁶See Bullock (1900), p. 131, Nettels, (1934), p.265, and Russell (1988), pp. 47-48.

⁵⁷See Breckinridge (1903), p. 52, and Hurst (1973), p. 40. West (1978) stresses the role of colonial paper currency in providing a "means of settlement," but does not mention legal tender laws explicitly.

⁵⁸Even before the blanket legal tender prohibition, the British government had intervened to prevent particular colonies from making their currencies legal tender. It also intervened to force some of the colonies to back their legal tender currencies more carefully with future tax receipts, and to prevent others from issuing currency on loan. See Davis (1900, vol. I and II), Ferguson (1953), Ernst (1973), Brock (1975), Smith (1984, 1985b) and Russell (1988).

For the history of the Currency Acts, see Davis (1900), Greene and Jellison (1961), Ernst (1973), Brock (1975), Smith (1985) and Russell (1988).

⁵⁹In 1767, Ben Franklin wrote that "On the whole, no method has hitherto been formed to establish a medium of trade, in lieu of money, equal, in all its advantages, to bills of credit, funded on sufficient taxes for discharging it, or on land security ... and in the mean time made a GENERAL LEGAL TENDER." [Franklin (1971), p. 354; his emphasis.] Ferguson

(1953) writes that "The restraining act of 1764 ... prohibited legal tender laws and required that existing legal tender currencies be sunk at their expiration dates. Many colonies protested, in the belief that the legal tender feature was an essential prop to their currency. Experience was to show, however, that the restriction did not materially impair the workings of the currency system" (p. 177).

⁶⁰For discussions of the strong performance of nontender paper currency, see Ernst (1973), Smith (1984b) and Russell (1988).

⁶¹See Ferguson (1953), pp. 177-180. Inconvertible government currency which was *not* legal tender is of special historical interest because it was issued under circumstances that approximated relatively closely the circumstances under which inconvertible private currency might have been issued. This was especially true when, as was frequently the case, the currency was issued on loan rather than in anticipation of taxes. Russell (1988) argues that the success of government, non-legal-tender, inconvertible land banking before the Revolution provides indirect evidence that private inconvertible banking might have been feasible after the Revolution, had it been legally permitted.

to prevent repudiation by prohibiting the states from issuing their own currency, or from making privately issued currency legal tender.

During the Revolutionary War, the Continental Congress was the American central government, and bore primary responsibility for conducting and coordinating the war effort. It also faced a critical financing problem: under the Articles of Confederation, it lacked the power to levy taxes. (Colonial opposition to British taxation had been one of the most important causes of the rebellion.) During the early stages of the Revolutionary War, the Congress attempted to subsist on voluntary contributions from the colonies. When this source of revenue proved insufficient, it began to issue bills of credit—the renowned “continentals”—which were backed by little more than the pious hope that the states would eventually provide funds, or authorize tax levies, to retire them. The likelihood of such retirements became ever more distant as the quantity of continentals increased and the states supplemented them with their own currency issues. Both forms of paper currency began to depreciate—at first gradually, and later very rapidly. By the end of the war, they were virtually worthless.⁶²

During the brief “critical period” between the end of the war (in 1783) and the ratification of the U.S. Constitution (in 1789), the newly independent states began to reorganize their finances and consider the problem of providing a paper currency. A number of states issued or seriously considered issuing bills of credit in anticipation of taxes or on loan—much in the manner of the prerevolutionary colonies.⁶³

Unfortunately, the continental hyperinflation had fractured the prerevolutionary consensus regarding the usefulness of paper currency. People who had accepted continentals or continental-denominated securities from government or private parties were outraged that the states ap-

peared to have no intention of redeeming them at anything close to the values at which they had traded during the early years of the war. Indeed, the propertied classes came to view paper currency as a device by which popularly elected governments sought to permit the common people to escape the burden of their public and private debts. (The lengthy trade depression that followed the end of the war had increased private debt burdens.) Wealthy Americans became terrified that the state legislatures, which were now free from British restraint, would reprise the Revolutionary experience by issuing large volumes of inadequately backed legal tender bills—bills which would rapidly depreciate, and which could be used to retire debts at a fraction of their real value. As a result, proposals to issue paper currency that would have received consensus support before the Revolution now became the subjects of intense political controversy.⁶⁴

In Rhode Island, radical populists gained control of the legislature. They confirmed the worst fears of the anti-paper money conservatives by issuing a legal tender currency, and then engineering a rapid inflation that seemed clearly designed to enable borrowers to escape their debts.⁶⁵ In Massachusetts, an agrarian insurrection (Shay's Rebellion) erupted as a result of the refusal of the legislature to issue legal tender paper currency.⁶⁶

As it happened, the Constitution was written and ratified during a period of conservative ascendancy—a reaction against excesses of the sort epitomized by events in Massachusetts and Rhode Island.⁶⁷ The conservatives desired a “hard” currency immune from depreciation. As a result, the framers of the Constitution were not content merely to deprive the states of the right to issue legal tender bills; instead, they were prohibited from issuing currency of any kind. Specie was established as the new nation's sole legal tender currency—and, in the minds of many, as the nation's only legitimate currency.

⁶²For a good account of the history of the Continentals, and indeed of Revolutionary War finance, see Ferguson (1961). See also Calomiris (1988).

⁶³For general discussions of currency issues by (incipient) states during the critical period, see Nevins (1924), Ferguson (1961), Nettels (1962), Russell (1988) and Schweitzer (1989).

⁶⁴For descriptions of public attitudes toward paper currency during the critical period, see Libby (1894), Hammond (1957) and Ferguson (1961).

⁶⁵Most of the other colonies that issued legal tender bills also experienced serious depreciation—though not on the scale of

Rhode Island. On the other hand, colonies that issued nontender bills experienced little or no depreciation. For a discussion of this question, see Russell (1988). For descriptions of Rhode Island's post-revolutionary currency policy, see Phillips (1865), Bates (1898), Nevins (1924) and Ferguson (1961).

⁶⁶The classic study of Shay's Rebellion is Taylor (1954).

⁶⁷This point is made by Ferguson (1961), pp. 249-250, Nevins (1924), p. 537, and Schweitzer (1989), pp. 319-320.

Thus the peculiar historical circumstances of the post-revolutionary critical period had a profound and lasting impact on the nature of the U.S. monetary system. The trauma of the Revolution made the currency system controversial, and ultimately produced a system very different from the relatively uncontroversial system of late colonial times. Indeed, it seems likely that had the colonies been able to escape British domination without fighting an expensive war, or had the principal *casus belli* not been one which required that the war be financed by means which sowed the seeds of a divisive struggle between classes, the United States might have begun its existence with a decentralized currency system based on (non-legal tender?) bills of credit issued by state governments.⁶⁸

The Constitution was silent on the question of privately issued currency. Indeed, during the years immediately following its ratification, issuance of small-denomination liabilities which might circulate as currency (which might “pass current,” to use the contemporary phrase) was regarded as a right of all free persons. By the second decade of the nineteenth century, however, the legislatures of most of the states had acted to eliminate or greatly restrict that right.⁶⁹ There were at least two reasons for this. One was the problems caused by irresponsible, or downright fraudulent, private issues. Another, which was perhaps more compelling, was the desire of the state legislatures to reserve the right of note issue to state-chartered banks.⁷⁰

The Constitution had also been silent regarding the right of the states (or the federal government) to charter banks of issue—perhaps because private banking had little history in the colonies. In Massachusetts, the most economically sophisticated colony, efforts to organize a private land

bank along the lines of public land banks began late in the seventeenth century and persisted episodically for the next five decades. The mercantile community was somewhat skeptical of land banking, however, since it threatened to compete with their own lending activities. [Merchants in the coastal cities provided a good deal of trade credit to the merchants and farmers of the interior.] In addition, the colonial authorities (both administrative and legislative) were reluctant to give up their monopoly over paper currency—partly out of fear that a form of money issued outside of official control might be subject to manipulation, and partly out of concern that it might reduce potential revenues from seigniorage. Although various private land bank projects received considerable popular support, they were unable to surmount this political opposition.⁷¹

By 1740, however, the restrictions on colonial issues which had been imposed by the British government had become so onerous (land bank issues, in particular, had been entirely prohibited) that the Massachusetts legislature was willing to charter a private land bank. While the land bank project received broad support from the public, it was vehemently opposed by the colony's governor (a creature of the British), who viewed it as weakening the mother country's control over the colony's economy. The land bank was also opposed by British merchants, who saw it as a threat to their near monopoly over trade credit. Both groups appealed for relief to Parliament, which responded by enacting legislation prohibiting the establishment of banking corporations anywhere in the colonies.⁷²

The legislatures of the newly independent states saw chartered banking as a means by which they could provide their citizens with paper currency while at the same time (in many cases) providing

⁶⁸Many historians believe that resentment over British efforts to regulate colonial currency practices played a major role in stimulating the Revolution. [See Bullock (1900), pp. 56-59, Davis (1900), vol. 1, chapter XXI, vol. 2, pp. 256-61, Brock (1975), pp. 561-63, Billias (1959), p.42, and Ernst (1973), pp. 359-60, for example.] This makes it seem very ironic that the currency restrictions the U.S. Constitution imposed on the states were generally more restrictive than any the British had ever imposed. [One exception is that the states could charter private banks of issue, something the British had prohibited the colonies from doing. It is not completely clear that the framers actually intended to authorize state-chartered banking, however (see below).]

⁶⁹See Hammond (1957), pp. 27-29, 184-85 and Fenstermaker (1965a), pp. 21-22.

⁷⁰Both these motives are mentioned by Hammond (1957), pp. 27-29, 159-60, 184-85. See also Fenstermaker (1965a), pp.

15-16. The importance of the latter motive is indicated by Hammond's comment that restrictions on unincorporated note issue were enacted “on the complaint of chartered banks” (p. 184).

⁷¹In 1714 there was a well-organized and determined attempt to organize a private land bank—an attempt which was supported by some influential British merchants, and received the endorsement of the Board of Trade. The government of Massachusetts responded by establishing a public land bank. See Billias (1959), pp. 3-5, Nettels (1934), pp. 271-275, Davis (1900), volume I, pp. 56-61, volume II, pp. 82-91, Ernst (1973), pp. 27-28, and Metz (1945), chapters 3,4.

⁷²See Billias (1959), Davis (1900), volume II, pp. 130-261, Hammond (1957), pp. 24-25, Brock (1975), pp. 123-27, Ernst (1973), pp. 34-35, and Metz (1945), chapter 10.

themselves with revenue. Of course bank charters would be more valuable to their holders, and thus issuing charters would be more lucrative for the states, if the charters conveyed an *exclusive* right to issue paper currency. This accounts for the prohibitions against private issues from other sources.⁷³

But what sort of banks should the states charter? While it might seem that the colonies' extensive experience with public land banks should have led them, as states, to charter private land banks, they did not in fact do so. Two factors may help explain this situation. The first is that the right of the states to charter banks of any sort was not altogether clear; indeed, the view that they did *not* have this right was widely held.⁷⁴ Doubts about state charter rights seem to have existed on two levels. Many, and perhaps most, informed Americans believed that the Constitution established *specie* as the only legitimate form of "money." The question then became "What is 'money'?" and, in particular, "Are bank notes 'money'?" A conservative view was that the category "money" did include bank notes, and indeed paper bills of all descriptions, so that paper currency in any form was proscribed. A more moderate view was that bank notes *convertible in specie* were not money, but merely its "representative," and thus were not constitutionally prohibited.⁷⁵ This view implied that private land banking conducted along colonial lines, which is to say through the issuance of inconvertible notes, involved direct creation of money, and was therefore unconstitutional—even if the bills were not legal tender.⁷⁶

A second possible reason why the states did not opt for some form of land banking was that, given

their British-imposed lack of experience with private banking, their only models for bank charters were those of British banks—which meant, for all intents and purposes, the charter of the Bank of England. Indeed, the charters of many of the earliest state banks were virtual carbon copies of the Bank of England's charter. The attractiveness of the British model may have been enhanced when, shortly after the Constitution was ratified, the Federal government decided to seek a charter for a single "National Bank" along the lines of the Bank of England. This institution was called the "Bank of the United States," and was established in 1791 with a 20-year charter. Though the U.S. Bank was basically a private organization, the Federal government held a minority interest, and the Bank was expected to provide a variety of financial services for the government in addition to its private lending activities.⁷⁷ The early state banks seem to have been intended as state versions of the U.S. Bank. This is reflected in the fact that until the charter of the U.S. Bank expired in 1811, most states chartered just one or, at most, a handful of banks.⁷⁸

The failure of the first U.S. Bank to secure a new charter was due to a combination of doubts about its constitutionality, suspicion of its power, and discomfort with the fact that much of its stock was foreign-owned.⁷⁹ The demise of the bank coincided with a period of national economic expansion associated partly with the impact of the Napoleonic Wars on commodity prices, and partly with the settlement of the western (trans-Appalachian) region. Across the United States, and particularly in the new states and

⁷³The motives (and actions) of the states in this regard were similar to those of any license-granting monopolist. The strategy was evidently based on the British example. During the eighteenth century, the British government had repeatedly extracted large payments, or loans on favorable terms, from the Bank of England in return for extending or strengthening its monopoly on note issue. A distinctively American variant of this strategy was for a state government to require a bank's organizers to cede the state an equity interest in return for granting the bank a charter. Sometimes the interest was ceded *gratis*, and sometimes merely on favorable terms. This practice was particularly common in the southeastern states. In several of these states bank dividends accounted for a substantial portion of state government revenues. [See Fenstermaker (1965a), pp. 17-20. For a thorough analysis of the importance of dividends from bank stock in state government finance during this period, see Sylla, Legler and Wallis (1987).]

⁷⁴For a general description of the nature and source of doubts about the constitutionality of state banks see Hammond

(1957), pp. 103-13, 564-71, and Hurst (1973), pp. 11-12, 141-45.

⁷⁵See Hammond (1957), pp. 61, 105-06, Gallatin (1879), pp. 254-55, (1879), p. 379, Bancroft (1831), p. 40.

⁷⁶The relatively radical view that private or even public land banking was consistent with the Constitution, so long as the states did not try to make the notes of such institutions legal tender (or even, perhaps, if they did), did not become popular until the economically troubled period following the Panic of 1819.

⁷⁷For the history of the first U.S. Bank, see Holdsworth (1910).

⁷⁸For information concerning state banks chartered before 1819, see Fenstermaker (1965b).

⁷⁹See Hammond (1957), pp. 209-26, and Holdsworth (1910).

territories of the West and South, banks were chartered in large numbers.⁸⁰ These new banks differed from the established banks in one critical respect: they were organized primarily to provide credit to farmers.⁸¹

Economic Depression and Its Consequences

Synopsis: The lengthy and severe depression that followed the Panic of 1819 placed great strains on the U.S. banking and currency system. The crisis exposed a basic inconsistency between two goals of the developing banking system: specie convertibility of bank currency, on one hand, and liberal extension of farm credit, on the other. Many of the southern and western states, in which farmers predominated, responded by experimenting with systems in which banks issued inconvertible notes. While some of these systems were clearly not viable, others appear to have had promise. The federally chartered Bank of the United States intervened to put an end to all of them, however.

At this point in U.S. history, a conflict arose between the needs of economic development and the devotion to "hard money" which grew out of the Revolution. Economists since the time of Adam Smith had understood that banks which issued convertible notes, and thus were vulnerable to runs, could not safely lend to farmers: farm loans were typically long term, illiquid and relatively risky.⁸² The need for farm credit was sufficiently great, and public understanding of banking sufficiently slight, however, that the legislatures of the southern and western states

permitted (and indeed encouraged) their banks to finance large quantities of farm credit by issuing convertible notes.⁸³

The collapse in agricultural prices which occurred during 1818-19 (and led to the Panic of 1819) made the two mandates of the southern and western banks—prompt specie redemption of notes, and liberal extension of farm credit—impossible to reconcile.⁸⁴ The price collapse produced widespread loan defaults and runs on banks. Since agricultural loans were impossible either to collect or to sell in a short time, the runs could be stopped only by *suspending specie payments*—by refusing to redeem bank notes in specie on demand. Even after the runs subsided, however, the defaults represented tremendous losses for the stockholders of banks that were willing, or could be compelled, to honor their convertibility commitments. Indeed, a large number of western banks had become insolvent.⁸⁵ The managers of the southern and western banks responded by declining to resume payments, and their notes continued to trade at substantial discounts in the open market. The holders of these notes were forced, in effect, to bear some of the financial losses associated with the Panic.

The governments of the western and southern states responded to this situation in very different ways. Most western states had banking systems composed of large numbers of relatively small banks. Since the losses associated with the price collapse and Panic were particularly heavy in the West, most western banks were insolvent, or nearly so; their notes were trading far below par. Many westerners viewed the events of 1818-19 as a conspiracy on the part of the "monied interests" to ruin them and seize

⁸⁰At the time, the western region included western Pennsylvania, Ohio, Kentucky, Tennessee, Indiana, Illinois and Missouri. (The following account applies most closely to the experience of the last five states listed.) The southern region included Virginia, North Carolina, South Carolina, Georgia and Alabama. (The following account applies most closely to the experience of North Carolina, South Carolina and Georgia.)

For information concerning state banks chartered before 1837 see Fenstermaker (1965a).

⁸¹For a discussion of the development of agricultural (and other types of long-term) banking see Hammond (1934), Hammond (1957), pp. 676-80, and Redlich (1951), vol. 1, pp. 11-13, 44-45.

⁸²Many farm loans were seasonal loans to finance planting or harvesting the crop. Variation in weather conditions and crop prices could make such loans quite risky, and by contemporary commercial standards they were relatively long term. However, a good deal of farm credit involved much longer-term loans to finance the purchase and/or clearing of land, the purchase of equipment (and in the South, slaves), etc. Most loans for these purposes were "accommodation loans." An accommodation loan did not

have a fixed term; the borrower was expected to pay an "installment" equal to a fixed fraction of the principal (typically, 10 percent) every 90 days. In practice, installments could be deferred and/or reduced, so that the lifespan of an accommodation loan could greatly exceed the term implied by these conditions. Crop loans might also be extended as accommodation loans, with the presumption that they would be fully repaid at the end of the season. Very often adverse circumstances made this impossible, however. See Fenstermaker (1965a), pp. 47-49, Redlich (1951), volume I, p. 11, Holder (1937), pp. 119-22, and Russell (1989a), pp. 69-73.

⁸³See Hammond (1957), pp. 178-83, Redlich (1951), pp. 9-12.

⁸⁴For descriptions of and data on the price collapse, see Cole (1938), Berry (1943), Smith (1953) and Russell (1989c).

⁸⁵A list of the banks which failed during or shortly after the Panic can be compiled from information presented by Fenstermaker (1965a). Berry (1943) provides information concerning bank failures in Ohio during this period.

their property. The banks, they believed, had been agents of this conspiracy. Consequently, the western legislatures moved to revoke their charters and/or to force them to liquidate. Private banks were replaced by monolithic, state-managed organizations called "Banks of the State" or "relief banks." They were supposed to lend inconvertible notes which would be given quasi-legal tender status by their states.⁸⁶

The history of the relief banks was brief, controversial, and generally undistinguished. Since their mandate was to lend liberally to financially distressed farmers, the market value of their loan portfolios was low relative to the nominal value of their outstanding notes. This circumstance was reflected in the deep discounts on the notes.⁸⁷ The lending standards of the Illinois relief bank were so lax, and its efforts at collection so ineffectual, that its notes soon became virtually worthless.⁸⁸

Both the legislation that created the relief banks and the "stay laws" which made their notes quasi-legal tender were of doubtful constitutionality. These laws were challenged vigorously in state and federal courts. In Kentucky, Tennessee and Missouri, these challenges ultimately led to the demise of the relief banks.

Some of the federal court challenges were orchestrated by the second Bank of the United States. In 1816, Congress had responded to financial problems created by the War of 1812 by chartering a second U.S. Bank. The new bank was (again) a private institution, though the federal government held a sizable minority interest. The term of its charter was 20 years.⁸⁹

The U.S. Bank's charter required its notes to be strictly convertible. The Bank's management believed that it could circulate convertible notes in the west and south only if the notes of its local competitors were also convertible. The management also believed that acquiring a large local circulation was essential if the Bank were

to earn a profit on its southern and western operations, or effectively perform its duties as the payments agent of the federal government.⁹⁰ The Bank consequently made strenuous efforts to force the western banks to return to the specie standard. This policy allowed it to extend the scope of its activities in the West, while striking a pose as the defender of sound currency. In the meantime, bitter political controversy over the redistributive implications of the activities of the Banks of the State greatly reduced their effectiveness.⁹¹

In many ways, the relief banks were direct descendants of the public land banks that had been quite successful, and had enjoyed consensus public support, during the years preceding the Revolution. Unfortunately, the extraordinarily adverse economic circumstances which led the western states to circumvent the Constitution by creating these institutions also served to ensure their ultimate demise. The relief banks were created by the state legislatures for the purpose of relieving the financial plight of their constituents, rather than to provide a sound currency, or to earn revenue (which is to say profits) for the states.⁹² This mandate, combined with the depth of the agrarian distress, made it impossible for the banks' managers to resist making too many loans to troubled farmers—who were already burdened with debt and whose ability to repay was very doubtful. The same circumstances led the states to supplement the relief bank legislation with stay laws and related provisions. These provisions made the banks extremely controversial, earning them the enmity of creditor interests in general and the powerful United States Bank in particular.

The failure of the relief bank experiment had an effect on public attitudes toward monetary issues that was reminiscent of public reaction to the Revolutionary hyperinflation. People became increasingly suspicious of banks and paper cur-

⁸⁶The best available account of the Panic and its aftermath is Rothbard (1962).

The legislatures of these states enacted "stay laws" which provided that foreclosures and other legal actions for the collection of delinquent debts ("executions," to use the contemporary description) could be delayed for long periods—typically a year or more—unless the creditors in question were willing to accept Bank of the State notes at par. See Rothbard (1962), chapters II, III.

⁸⁷Data on the discounts on the notes of the Kentucky relief bank are available from Berry (1943) and Sumner (1896). Fenstermaker (1965a) presents somewhat less complete information on the discounts on other relief bank currencies.

⁸⁸See Rothbard (1962), pp. 41-42, 80-83; see also Dowrie (1913).

⁸⁹See Catterall (1902), chapter I.

⁹⁰See Catterall (1902), pp. 96-99, Redlich (1951), pp. 109-10, 124, 128-29, 440-44, Temin (1969), p. 49, and Fraas (1974).

⁹¹For accounts of the demise of the relief systems, see Rothbard (1962), Chapter III, Hammond (1957), pp. 282-285, and Sumner (1896).

⁹²See Fenstermaker (1965a), pp. 26-27, Rothbard (1962), pp. 81-83, 85-86, 102-03, and Sumner (1896).

rency, and increasingly enamored with “hard money”—specie, or bank notes rigidly convertible into specie. The demise of the relief banks also gave the Bank of the United States a virtual monopoly over banking in much of the West.

The southern states tried a different—and initially, at least, more promising—experiment with inconvertible banking. The southern banks, unlike their western counterparts, were large but few in number; frequently, they operated branches across their respective states. The southern state governments held large minority interests in these banks. Since the dividends on the shares provided an important source of state revenue, the state legislatures had no desire to see the banks close down.⁹³ In addition, since the financial distress that accompanied the Panic was less severe in the South than in the West, the popular outcry against the banks was somewhat less strident there. Finally, because of their large size and branch systems, the banks of the region were more effectively diversified than their western counterparts, and requirements imposed by their charters had kept them relatively highly capitalized.

When the southern banks suspended the convertibility of their notes, the governments of the southern states did not force them to liquidate, or even to close down. Instead, the banks were permitted, and often encouraged, to continue to do business—lending, collecting on loans, and conducting other financial transactions, all through the medium of their now-inconvertible

notes.⁹⁴ These notes dropped to variable discounts (against specie) in the open market. Variation in these discounts seem to have reflected changing market conditions—much like the variation in modern national currency exchange rates.⁹⁵

Economic historians have usually viewed the suspensions as irregular events completely inconsistent with the maintenance of monetary and financial stability.⁹⁶ There are good practical and theoretical arguments against this view, however. On a practical level, the banks stayed in business, and continued to supply badly needed currency and credit, despite the depressed conditions created by the collapse in prices and the financial panic. This situation stands in marked contrast to that of the West. There, the banking system collapsed, and a scarcity of currency and credit threatened to bring economic activity to a standstill.

On a theoretical level, the suspensions shifted some of the burden of the banks' portfolio risk from shareholders to noteholders.⁹⁷ The price collapse and panic had revealed the true extent of the risks the banks faced, and had exacerbated the already acute scarcity of financial capital—particularly concentrated financial capital—in the relatively undeveloped southern states.⁹⁸ Under these circumstances, it seems doubtful that current or future bank shareholders would have been willing to continue to bear all of the banks' portfolio risk—particularly in light of the heavy losses that a prompt return to specie payments would have imposed.⁹⁹

⁹³See note 73 above.

⁹⁴For a description of banking in North Carolina after the suspension, see Russell (1989a).

⁹⁵Note discount data for North and South Carolina state banks during 1817-1829 are provided by Russell (1989a). Fenstermaker (1965a) provides less complete data for all the southern states.

⁹⁶For expressions of this view see Gouge (1833), Sumner (1896) and Klein (1974).

⁹⁷Before the suspensions, the notes of southern state banks had traded at or near par with specie; afterwards, they traded at variable discounts. Thus it seems clear that the suspensions exposed noteholders to risks they had not previously borne. The author believes that after the suspensions, the market priced bank notes in much the same manner as modern mutual fund shares. This sort of pricing scheme would have linked the value of a bank's notes to the value of its assets—a link which was absent under convertibility. [See Russell (1989b,c).] Other theories of inconvertible note pricing have broadly similar implications, however. The most popular alternative theory is that the notes of a suspended bank were priced as risky titles to future specie, payable if and when the issuing bank resumed payments. Since the state of a bank's portfolio was probably the biggest single factor influencing the prospect that it would be able to re-

sume, this theory also implies that the holders of inconvertible bank notes were bearing portfolio risk. And because all of the portfolio risk had to be borne by the holders of the banks' liabilities, any risk borne by noteholders reduced the risk born by shareholders (and vice-versa).

Another alternative theory is that bank notes traded at a discount during suspension because holders' inability to convert them into specie temporarily reduced their usefulness, relative to specie, as media of exchange. Advocates of this theory typically view suspensions as a sort of “safety valve” protecting fractional reserve banking systems operating under *laissez-faire*—operating without, that is, government deposit insurance and/or a government lender of last resort. For expressions of this view see Friedman and Schwartz (1963), pp. 163-68, 324-32, and Dwyer and Gilbert (1989).

⁹⁸The charters of contemporary banks specified minimum denominations for shares which were usually well out of reach of the common people. The rationale behind these minima is not entirely clear. See Russell (1989a), pp. 35-36.

⁹⁹The North Carolina banks, in particular, decided to close down when specie payments were finally imposed on them in 1828-1829. See Russell (1989a), pp. 25-32, 78-80, Holder (1937), pp. 250-51, and Flanagan (1934).

A case can be made that the post-Panic suspensions began a process which, had it been allowed to proceed unhindered, might have enabled the South to develop an alternative banking system which was peculiarly suited to its distinctive needs. Because the southern economy was dominated by agriculture, banks could be useful to southern economic development only if they were able to make farm loans in large volumes. Farm loans, however, were relatively risky—and under convertibility, these risks were borne almost exclusively by bank stockholders. These stockholders had both the opportunity and the means to lend outside the South, and could be induced to take these large risks only in return for high average rates of return. Such rates would have made bank credit too expensive for many farmers—and usury laws might have prevented the banks from charging them in any case. One solution to this problem was the development of an alternative banking system which could bring the diffuse financial capital of the common people into the risk-bearing process. Inconvertible *private* banking seems to have had the potential to provide such a system.¹⁰⁰

Unfortunately for the southern banks, both the federal government and its financial agent, the Bank of the United States, regarded the suspensions with almost unalloyed hostility. The U.S. Treasury Department was deeply (and somewhat irrationally, under the circumstances) committed to fiscal arrangements under which payments to the federal government (for taxes, land purchases, etc.) were made exclusively in par currency.¹⁰¹ Southerners, however, were used to making government payments in local (bank) currency, which was no longer trading at par. The Bank of the United States, which was charged with the

responsibility of receiving and clearing the payments, found itself wedged very uncomfortably in between. If the Bank accepted discounted state bank notes at par for government payments, the Treasury would insist that it clear them at par, and the Bank would take large exchange losses. If it did not accept state bank notes at all, it would at the very least offend the people of the South—a region where it greatly desired to extend its business—and might well materially increase their economic troubles. The Bank would also offend the Treasury, its patron, which wished to ensure that federal payments could be made in currency readily available to the public.¹⁰² Finally, if the Bank accepted state bank notes at their market rates of discount, it would be accepting a situation which, it believed, prevented it from operating profitably and effectively in the region.¹⁰³

The Bank's problems would have been solved if the southern banks had resumed specie payments promptly after the Panic. When they did not, it launched a campaign to force them to do so. It continued to accept discounted state bank notes in payment of federal debts and, when it had accumulated them in large quantities, presented them at the counters of the state banks for payment. When the southern banks refused to pay, the U.S. Bank filed suit against them in federal court.¹⁰⁴

While the suspensions had no formal legal validity—in principle, each bank note was redeemable at par and on demand, and a bank which declined to redeem its notes had defaulted on its debts—they were implicitly (and sometimes explicitly) tolerated by state legislatures and courts. The U.S. Bank, however, was in a position to sue in federal courts, which provided the state banks no such protection.¹⁰⁵

¹⁰⁰This argument is presented in detail in Russell (1989a,b).

¹⁰¹It seems likely that the exchange problems described here could have been avoided if the Treasury had been willing to accept and disburse state bank notes at their market rates of discount. A similar situation had arisen after the general suspension, of specie payments which occurred in August of 1814, near the end of the War of 1812. During the months after the suspension, the Treasury needed funds to service debt held by residents of New England. New England was the only region of the United States in which the banks had not suspended specie payments, so New England bank notes were trading at par with specie. Unfortunately, most of the federal government's revenue was received in the mid-Atlantic region. The mid-Atlantic banks *had* suspended, and their notes were trading well below par. The Treasury insisted on accepting local currency at par in payments to the federal government, and on disbursing such currency only where it would be accepted at par. This forced it into temporary default on its debt service payments, despite its large balances of mid-Atlantic bank notes. See Catterall (1902), pp. 4-7, and Bancroft (1831), pp. 47-49.

¹⁰²For a general description of the U.S. Bank's problems as a federal collection and clearing agent, see Catterall (1902). For accounts of its disputes with the banks of Georgia and North Carolina, see Govan (1937), Heath (1954), Holder (1937) and Russell (1989a). These accounts are based on correspondence between the U.S. Bank, the Treasury Department, and the state banks that is recorded in the American State Papers, Finance, Volume 4.

¹⁰³See note 90 above.

¹⁰⁴Govan (1937) and Russell (1989a) describe federal court suits filed by the U.S. Bank against state banks in Georgia and North Carolina, respectively.

¹⁰⁵See Hammond (1957), pp. 283-84, and Russell (1989a), pp. 42-43. The efforts of various southern and western states (notably Georgia) to evade adverse federal court decisions concerning the U.S. Bank were ultimately rejected by the U.S. Supreme Court. See Catterall (1902), pp. 88-91, Govan (1937), and Hammond (1957), pp. 263-68, 272-73.

The efforts of the U.S. Bank slowly forced the banks of the various southern states to resume payments: Virginia and South Carolina in 1823, Georgia in 1825, Alabama in 1827 and North Carolina in 1828. In view of the conventional wisdom regarding suspensions, it should come as no surprise that most economic historians have regarded the Bank's resumption campaign as virtuous and constructive; the Bank is lauded, in particular, for having created a "uniform national currency."¹⁰⁶ Southern farmers, and other southerners whose livelihood was based, directly or indirectly, on farming—groups which collectively comprised the bulk of the region's population—had less reason to sing the Bank's praises. The cost of resumption was that state banking systems (or those portions of them which survived) became reluctant to lend to farmers. Since there were few alternative sources of credit available, farm loans became substantially more difficult to obtain.¹⁰⁷ It should thus be equally unsurprising that, just a few years later, the southern states were in the forefront of the opposition to the Bank's efforts to secure a new charter.¹⁰⁸

A Bank War and the Rise of Free Banking

Synopsis: The political controversy that led to the demise of the Bank of the United States had a profound effect on public attitudes toward the banking and currency system. The American public became suspicious of any hint of monopoly power in banking and of any link between the federal government and private banks. It also became increasingly devoted to the concept of hard money. One outgrowth of these attitudes was that many states adopted laws providing for "Free Banking." Free banking laws encouraged entry into banking, and resulted in the establishment of large numbers of banks. The free banks were heavily regulated, however; their notes were to be carefully secured, and strictly convertible. Other results of changed public attitudes were the "Specie Circular" and the "Independent Treasury." The federal government became reluctant to accept

bank currency in payment, and attempted to conduct its financial operations without the aid of banks.

The election of 1828 transferred control over the federal administration from the Whigs, led by defeated President John Quincy Adams of Massachusetts, to the Democrats, led by President-elect Andrew Jackson of Tennessee. The Democrats regarded themselves as the party of the common (and thus largely agricultural) people; they had long been advocates of competitive, decentralized state banking and opponents of the Banks of the United States. The party also contained a hard money faction which was deeply suspicious of banking of any kind. Jackson himself seems to have had somewhat ambiguous feelings toward banking. On one hand, many of his principal advisors were men who had defended the relief banks and bitterly resented the damage the U.S. Bank had done to the banks and people of the western states. Some of these men were now connected with the state banks, and thus tended to formulate policies which favored their interests *vis-a-vis* those of the U.S. Bank. On the other hand, Jackson is said to have been personally opposed to banking and paper currency of any sort; late in his administration he took actions that greatly increased the problems of the state banking systems.¹⁰⁹

Jackson's State of the Union message in 1829 came out against the recharter of the United States Bank. (The Bank's charter did not expire until 1836, but its friends in Congress had begun to agitate for an early recharter act.) Jackson argued that the Bank's constitutionality was doubtful, and that its concentrated financial power was inconsistent with the tenets of representative democracy. Jackson's message marks the beginning of the "Bank War," a period of five years or so during which the Whigs (who controlled Congress) attempted to defend the Bank against the increasingly vituperative attacks of the Democratic administration. During this period, the "Bank question" became the single biggest issue in national politics. The Democrats

¹⁰⁶See in particular Catterall (1902), Redlich (1951), Hammond (1957) and Temin (1969).

¹⁰⁷For the case of North Carolina, see Russell (1989a), pp. 71-74. In 1828, Georgia established the Central Bank, a state-owned institution designed to extend long-term loans to farmers and planters. Heath (1954) ascribes this decision to a shortage of long-term commercial bank credit that developed during the 1820s.

¹⁰⁸Catterall (1902), pp. 164-65, 235, Hoyt (1960) and Wilburn (1967), pp. 7-11, 17-19, describe southern support for the Bank War.

¹⁰⁹For descriptions of Jackson's attitude toward banking in general, and the United States Bank in particular, see Catterall (1902), pp. 182-85, Schlesinger (1953), pp. 76-78, Redlich (1951), pp. 162-71, Hammond (1957), pp. 346-50, and Temin (1969), chapter 2.

simultaneously exploited and encouraged public feeling against the banks so as to build up their political power base at the Whigs' expense. After Jackson was re-elected in 1832 the issue came to a head; Congress passed legislation rechartering the Bank, Jackson vetoed the legislation, and Congress failed (narrowly) to override his veto. The second U.S. Bank effectively ceased to exist as a national institution when its federal charter expired in 1836; its relationship with the federal government had been severed, and its power thus greatly reduced, two years earlier.¹¹⁰

The demise of the U.S. Bank raised two important questions: how should the federal government administer its financial affairs, and how should the states regulate their banking systems? The first question arose because the U.S. Bank had acted as the financial agent for the U.S. Treasury—in other words, as the federal government's bank. The second arose because the U.S. Bank no longer existed to regulate the state banks and, in particular, to enforce specie payments. By the second half of the 1830s, Jacksonian hard-money notions had become so pervasive that few people were prepared to accept a return to relatively *laissez-faire* banking, or to a currency which might come to consist largely of inconvertible bank notes. The effect of the Jackson Administration's anti-U.S. Bank campaign on a financially unsophisticated public had been to exacerbate its doubts about and suspicion of all banks and all paper currency.¹¹¹

The Jackson and Van Buren Administrations [Martin Van Buren, who was elected president in 1836, had been Jackson's vice president] responded to the first problem with two policy initiatives. The first was an executive order called the Specie Circular, issued in 1836, shortly before Jackson left office. This order directed the U.S. Treasury to accept no currency other than specie in payment of debts to the federal government.¹¹² The second policy initiative was the Independent Treasury Act, a product of the Van Buren Administra-

tion. This Act withdrew the U.S. government's cash deposits from the large state banks (sometimes called pet banks) where they had been placed after the demise of the U.S. Bank. Henceforth, the Treasury would act as its own banker. The net effect of these two actions was profoundly anti-banking. The federal government would no longer deal with the state banks, or encourage (or even recognize) their note circulation.¹¹³

The states' response to the problem of bank regulation reflected two features of public attitudes towards banking which had grown out of the Bank War: suspicion of concentrated financial power, and preference for "hard money." Under the bank chartering system that existed in most states prior to the late 1830s, the issuance of a charter required a special act of the state legislature. The process of securing legislative assent was lengthy, cumbersome, uncertain and occasionally corrupt; in addition, banks that already possessed charters generally lobbied vigorously against the issuance of new ones. The upshot was that most states had a relatively small number of banks, and that these banks possessed, or were believed to possess, considerable market power.¹¹⁴

The "free" in the free banking laws reflected the desire to reform the chartering process in the direction of free entry. Each state would formulate a standardized charter, and any individual or group which was able and willing to meet the terms of this charter could organize a bank in that state. The free banks would be regulated by the state auditor, or by a state banking agency created for that purpose; the legislature would be involved only indirectly. This system was intended to greatly increase the number of state banks.¹¹⁵

There is another sense in which the term "free banking" is a misnomer, however. Free banking was not in any sense *laissez-faire* or unregulated banking. The standardized charters imposed numerous and relatively stringent restrictions on the banks' capitalization and reserves, the condi-

¹¹⁰For accounts of the Bank War, see Catterall (1902), Hammond (1957) and Schlesinger (1953), among many others.

¹¹¹For a description of the Loco Focos (formally, the Equal Rights Party), a party of antibanking radicals which arose during the Bank War and was ultimately instrumental in the rise of Free Banking and the Independent Treasury, see Redlich (1951), pp. 188-90, Hammond (1957), pp. 493-99, and Schlesinger (1953), chapters XV-XVI.

¹¹²For analyses of the motivation behind, and/or the impact of, the Specie Circular, see Hammond (1957), pp. 455-57, Schlesinger (1953), pp. 129-31, Smith (1953), p. 185, Temin

(1969), pp. 120-28, Timberlake (1960) and Timberlake (1978), chapter 5.

¹¹³For discussions of the role of the Independent Treasury see Hammond (1957), pp. 542-45, Taus (1943) and Timberlake (1978), chapter 6.

¹¹⁴See Hammond (1963), pp. 7-8, (1957), pp. 577-80, Redlich (1951), pp. 188-90, and Schlesinger (1953), p. 286.

¹¹⁵For discussions of the rationale behind Free Banking see Redlich (1951), pp. 187-204, and Hammond (1957), pp. 572-80.

tions under which they could issue notes, and the types of assets they could hold. These restrictions were designed, in the “hard money” spirit, to ensure that the banks’ notes would always be convertible on demand, and that they would be relatively immune from losses associated with declines in the value of the banks’ assets. One restriction was so common that it has come to be regarded as characteristic of free banking: the notes of the free banks had to be 100 percent backed by holdings of state or federal government securities.¹¹⁶

Free banking experienced some problems, especially during its early years. It seems in particular to have been characterized by a relatively high rate of bank failures. These failures, and a few notorious instances of fraud, have given the system a bad reputation among historians.¹¹⁷ There were also many complaints that the need to keep track of the market values of the many different types of bank notes in circulation—some of which were counterfeit or issued by failed or insolvent banks—materially reduced the effectiveness of bank currency as a medium of exchange.¹¹⁸

Recent research has revealed that the losses to noteholders associated with free bank failures were actually quite small on average.¹¹⁹ Ironically enough, many of the losses and failures that did occur were caused by defaults on state government bonds, which were widespread during the 1840s and 1850s.¹²⁰ Entrepreneurs responded to the diversity of bank currencies by publishing “bank note reporters” in which the value of different bank currencies were recorded, insolvent banks identified, and the appearance of common counterfeits described.¹²¹ The system worked well enough that, until the Civil War broke out, there seems to have been little political support for any federally dominated alternative. Additional evidence that contemporary legislators

viewed free banking as viable is provided by the fact that new states continued to adopt free banking laws through the early 1860s. Rockoff (1975) notes that “on the eve of the Civil War over half the states, including the most populous states, had free banking laws.”¹²²

The Civil War and the Demise of State Bank Currency

Synopsis: The changes in the American currency system produced by the Civil War were almost as profound as those produced by the Revolutionary War. When the Civil War began, the U.S. had a relatively decentralized system in which paper currency was issued by state-chartered and -regulated banks; the federal government had no role in the provision of paper money, and there seemed little prospect that it would acquire one. When the war ended, the nation had a relatively centralized system in which paper currency was issued by federally chartered and regulated banks; it was no longer possible for state banks to issue paper money. In addition, the federal government had acquired and used the power to issue paper money and to make it legal tender. This huge, rapid transformation was possible for two reasons. First, the war produced a dramatic shift in the balance of power between the major political parties, and between state and federal governments. Second, the war produced an unprecedented need for federal government revenue.

The demise of free banking, and more broadly of the system of decentralized, state-regulated provision of currency, was caused less by any problems this system may have experienced than by the outbreak of the U.S. Civil War. This extraordinary political event created a pair of peculiar circumstances which helped determine the future

¹¹⁶See Rockoff (1975), pp. 2, 81-87, and Rolnick and Weber (1984), (1988).

¹¹⁷For unsympathetic descriptions of the record of Free Banking, or references to such descriptions, see Cagan (1963), pp. 19-21, Friedman (1960), p. 6, Hammond (1957), pp. 723, 741-42, (1963), Rockoff (1975), pp. i-ii, and Rolnick and Weber (1983).

¹¹⁸See Cagan (1963), pp. 19-20, Hammond (1957), pp. 722-23, (1963), p. 14, and Rockoff (1975), pp. 26-29.

¹¹⁹Rockoff (1975) and Rolnick and Weber (1983, 1988) use data drawn from state auditors’ reports to provide careful estimates of the costs of free bank failures. Rockoff estimates that the total losses endured by free bank noteholders from 1836 through 1860 were less than \$2 million—about the cost,

in 1860, of a single year of 2 percent inflation. The estimates provided by Rolnick and Weber are slightly higher (see their 1983 paper, p. 1089). Cagan (1963), by contrast, reports with apparent endorsement an estimate by Jay Cooke that the losses were \$50 million per year. Cagan’s use of this estimate in his influential article served to reinforce the conventional view that free banking was a national disaster.

¹²⁰See Rockoff (1975) and Rolnick and Weber (1982, 1983, 1984, 1985, 1988).

¹²¹See Hammond (1963), p. 14, Temin (1969), p. 50, and Rockoff (1975), pp. 23-25.

¹²²Rockoff (1975), pp. 2-4.

evolution of the U.S. currency and banking system. The first was that it gave the Republican party, the political successor of the old Whig party, almost complete control over the federal government. The majority of the Democratic congressmen and senators were southerners who abandoned their seats and defected to the Confederacy at the outbreak of hostilities. Since the Republicans had inherited from the Whigs a preference for monetary and financial centralization, while the Democrats remained the party of decentralization, the defection of the Democrats greatly increased the prospects for centralizing change in the monetary system.

The second determining circumstance was the federal government's need for enormous new sources of revenue. Though taxes played some role in Civil War finance, particularly in the war's later years, it was clear almost from the beginning that the bulk of the expenditure burden would be met by borrowing.¹²³ As the war's cost mounted, however, the federal government began to experience difficulty obtaining the sums required on the open securities market, and turned for assistance to the large Eastern banks.¹²⁴ Unfortunately, the sum required by the government far exceeded the banks' aggregate specie holdings; when the specie borrowed by the government failed for various reason to return to the banks as rapidly as they had anticipated, they were forced to suspend specie payments.¹²⁵ The suspension seemed to close off the possibility of further bank loans, leaving the federal government desperate for new sources of funds and for new ways to increase the demand for its debt.

One way in which the government might "borrow" was by issuing paper currency. Early in 1862, at the urging of Secretary of the Treasury Salmon

P. Chase, Congress passed the first Legal Tender Act. The Act authorized the Treasury Department to issue \$300 million in paper currency.¹²⁶ This currency was not convertible in specie, nor redeemable in specie at any fixed future date; it was, however, made legal tender in payment of public *and private* debts.¹²⁷ Later in the war, considerable additional quantities of these greenbacks were issued.

The Legal Tender Acts marked the first time in (post-revolutionary) U.S. history that the federal government had issued fiat currency—currency which was entirely irredeemable, and was legal tender for private debts. The Constitution did not give the federal government any explicit right to issue paper currency (fiat or otherwise), or to make paper currency legal tender; indeed, it contained language which was widely interpreted as implicitly denying the government these rights.¹²⁸ This made the legality of the Acts seem very doubtful. In the event, however, no attempt to challenge them managed to reach the Supreme Court until several years after the Civil War had ended. There ensued one of the more bizarre episodes in U.S. monetary history. Chase, who was now Chief Justice, voted with the court majority to strike down legislation whose form he had approved, and whose passage he had recommended, when he was Secretary of the Treasury! The greenbacks were saved when Congress, which remained dominated by the Republicans, voted to increase the number of Supreme Court justices by two; President Grant acted quickly to fill the resulting vacancies with judges who supported the Acts' constitutionality. The enlarged court voted 5-4, with Chase dissenting, to uphold the Acts.¹²⁹ This decision set a precedent that was later used to justify further steps on the part of the federal government to regulate or control the currency

¹²³For the government's reluctance to raise taxes during the early years of the war, see Mitchell (1903), pp. 16-19, p. 37, pp. 72-73.

¹²⁴The federal government's financing problems were greatly exacerbated by its reluctance to sell its securities, which typically returned interest at the rate of 6 percent of face value, at a discount—its reluctance, that is, to borrow at interest rates in excess of 6 percent. See Mitchell (1903), pp. 48-50, 64-65.

¹²⁵For accounts of the suspension see Mitchell (1903), pp. 37-43 and Hammond (1970), pp. 150-59.

¹²⁶The provisions of the first and the two subsequent Legal Tender Act(s) are summarized by Mitchell (1903), pp. 44-118.

¹²⁷In 1875, 10 years after the end of the war, Congress enacted legislation making the greenbacks convertible in specie, according to the prewar definition of the dollar, beginning in 1879. This legislation became known, somewhat misleadingly,

as the "Resumption Act." [The history and provisions of the Resumption Act are summarized by Friedman and Schwartz (1963), pp. 44-50. See also Timberlake (1978), chapter 8.]

¹²⁸For discussions of the constitutionality of legal tender federal currency, see Breckinridge (1903), pp. 114-37, Mitchell (1903), pp. 51-55, Hurst (1970), pp. 182-86, Christainsen (1988), Timberlake (1989), (1991), chapters 8-10.

¹²⁹See Breckinridge (1903), pp. 127-137, Friedman and Schwartz (1963), pp. 46-47, Mitchell (1903), pp. 71-74, and Timberlake (1989), (1991), chapter 9.

system—notably, the creation of the Federal Reserve System.

The greenbacks marked a change in the U.S. currency system which went beyond government issuance of currency. As has already been noted, the fiscal crisis of late 1861 caused the private banking system to suspend specie payments. On earlier occasions when there had been a national or regional suspension, most of the surviving banks had refused to redeem their notes in any way until they could resume redeeming them in specie on demand. The fact that the greenbacks were legal tender, however, gave bank debtors the legal right to use them to repay their debts. Since greenbacks began trading at substantial discounts shortly after they were first issued, moreover, debtors hastened to take advantage of this opportunity. The banks consequently felt entitled, and indeed compelled, to redeem their notes in greenbacks.¹³⁰ Thereafter, the banking system redeemed its notes and deposits almost exclusively in legal tender paper currency, regardless of whether it was convertible in specie. This ensured that goods and assets would be priced in legal tender paper—in other words, that government currency would replace specie as the nation's unit of account.

Because neither Congress nor the Administration was willing to risk a repetition of the Revolutionary hyperinflation, greenbacks could be used to finance at most a small portion of the wartime deficit.¹³¹ The balance of the deficit had to be financed by the issuance of conventional, interest-bearing debt.¹³² Secretary Chase responded to this situation by developing a strategy for monetary reform which promised to simultaneously achieve both currency centralization and debt demand enhancement. This program, which was ultimately embodied in the National Banking Act, called for the creation of a "National Banking System" (NBS)—a system of private, federally chartered banks which would be nationally regulated analogues of the state-chartered "free banks." The Act imposed reserve, capital, convertibility and other requirements that were generally similar to those

imposed on the free banks. These requirements were to be administered, and the national banks regulated, by a new federal agency called the Office of the Comptroller of the Currency.¹³³ For the first time in U.S. history, the federal government had moved to create a system of private banks (rather than a single, centrally administered private bank) under its direct regulatory control.

From the perspective of the currency system, the key features of the National Bank Act involved the notes the national banks were to issue. These notes were to be printed by the Treasury Department and issued to the banks, rather than printed by the banks directly; they were to look entirely uniform, except for an indication of the identity of the issuer. In order to obtain a given value of bank notes, a national bank had to deposit U.S. government securities of essentially equal value (state government securities would *not* do) with the Comptroller of the Currency. Thus, national bank notes were to be 100 percent backed by U.S. government securities.

The requirement that the notes be backed by *federal* government securities was designed to create a "captive" demand for federal debt on the part of banks of issue. Since notes were the principal liabilities of contemporary banks, and since the framers of the Act evidently expected most of the state banks to apply for federal charters, there was every reason to expect that the Act would force the banking system to purchase Treasury securities in large quantities. This, it was hoped, would materially ease the federal government's borrowing problems.¹³⁴

Congress, anticipating heavy demand for national bank notes, included provisions in the Act establishing a maximum quantity which could be issued and allocating this quantity across the various regions.¹³⁵ Contrary to expectation, however, during the year or so after the Act was passed the number of charter applications was small, and the volume of U.S. bonds deposited as note backing was far lower than anticipated. Congress

¹³⁰See Mitchell (1903), pp. 144-49.

¹³¹The limited financial resources of the southern states made it difficult for the Confederate government to borrow large sums. As a result, it was forced to cover a very substantial fraction of its deficit through currency creation. This strategy ultimately produced a hyperinflation. See Lerner (1956), and Timberlake (1978), pp. 102-03.

¹³²Mitchell (1903), pp. 119-31, discusses the reasons the federal government issued no greenbacks from 1863 to the end of the Civil War.

¹³³For the history and provisions of the National Banking Act, see Redlich (1951), pp. 99-113 and Hammond (1970), chapters 10-11.

¹³⁴Discussions of the budgetary motivations for the National Banking Act can be found in Hammond (1957), p. 725, (1970), pp. 135-36, 286-95, and Mitchell (1903), pp. 37, 44-45, 103, 109.

¹³⁵These provisions are summarized by Redlich (1951), p. 118.

responded by amending the Act to impose a punitive tax on state bank notes—a tax rate so high (10 percent) that it made note issue by state banks entirely unprofitable.¹³⁶ This decision eliminated state bank notes from circulation, and marked the final demise of state currency systems.

Of course, a system under which any currency that was not issued directly by the federal government was printed by the federal government, fully backed by U.S. Treasury securities, and issued in quantities and locations closely regulated by the government, might be said to have differed very little from a system under which the federal government directly issued all paper currency.¹³⁷ Indeed, it could be argued that the only really significant differences between the NBS and a direct note issue system were that under the NBS, the government (1) had little short-run influence over the total quantity of notes (which indeed proved relatively unresponsive to short-run influences of any kind), and (2) assigned the responsibility for clearing the notes (and thus for ensuring their convertibility in specie) to the issuing banks. When 50 years of experience with the system seemed to suggest that these features were serious liabilities, the federal government used the broad monetary powers it had acquired during the Civil War to establish a system of direct issue—the Federal Reserve System.

CONCLUDING REMARKS

The changes in the U.S. currency system that resulted from the Legal Tender and National Banking acts stand, along with the monetary clauses of the U.S. Constitution, as classic examples of cases in which the basic structure of the system was strongly influenced by extraordinary political events with largely non-economic (or at least, non-monetary) causes. If, as we have seen, the American colonies could have obtained their independence from Great Britain without fighting a long, expensive and divisive revolutionary war, the monetary history of the next 90 years might have been very different: historical evidence suggests that the

states might have retained the right to issue their own currencies, and that these currencies might not have been convertible in specie. Subsequently, if the American states could have resolved their sectional disputes without fighting a long, expensive and divisive civil war, the monetary history of the ensuing 50 years might also have been very different: historical evidence suggests that the states might have retained the right to charter banks of issue, and that the federal government's role in the U.S. currency system might have remained relatively limited.

It should also be remembered that the federal government chartered the second United States Bank in response to financial dislocations associated with the War of 1812.¹³⁸ In the absence of Second Bank opposition, the inconvertible banking systems that arose in the western and southern states after the Panic of 1819 might have survived and become entrenched; without a Second Bank for the Jacksonians to fight, the “hard money” principles of the Free Banking Era might never have become popular. Here again a sequence of essentially political disputes played a key role in dictating the evolution of U.S. currency arrangements.¹³⁹

Currency System Evolution: An Alternative View

As we have seen, U.S. monetary history has been punctuated by a sequence of rather abrupt transitions from one currency system to another with very different features. These transitions are often interpreted as part of a process of Darwinian advancement—a process, that is, through which old and relatively inefficient systems were replaced by new and more efficient successors. The modern currency system emerged out of this process as the most efficient system yet devised.

While this historical interpretation certainly sounds plausible, it is one that we should accept or reject on the basis of evidence concerning the relative efficiency of past and present currency systems. Unfortunately, the prestige of Darwinism

¹³⁶See Friedman and Schwartz (1963), pp. 18-19, Hammond (1957), pp. 732-34, and Redlich (1951), p. 113.

¹³⁷This point is made by Friedman and Schwartz (1963), p. 21.

¹³⁸See note 89 above.

¹³⁹Redlich (1951) comments that had Secretary Chase promoted the National Banking Act less vigorously, the early

Civil War suspension also might have led to the development of a currency system based on inconvertible bank notes (p. 95).

has become so great that economists tend to reverse the logical process by using the various systems' orders in the historical sequence as the basis for efficiency comparisons. (If only the fittest systems survive, then the systems that survived at each stage must have been the fittest.) The disappearance of older systems is regarded as compelling evidence that they were less efficient than their successors.

The claim that the currency system, if left to itself, tends to progress (slowly) in the direction of greater efficiency is not disputed in this article; indeed, several examples of this sort of progression have been presented above. What the article *has* argued is that the U.S. currency system has *not* been left to itself, and that its evolution has been anything but an orderly and inevitable progression toward economic efficiency. Instead, it has been dominated by political decisions that were largely uninfluenced by efficiency considerations. Many of these decisions were made in response to political pressures of a particularly urgent sort—pressures growing out of the U.S. government's (and earlier, the British and/or colonial governments') involvement in prolonged and expensive wars.

It is, of course, possible that we have been fortunate, and that the political process has given us a currency system that is very efficient, or at least more efficient than the historical alternatives. It is also possible that we have not been quite so fortunate; the question is a complex one, and cannot be answered here. This article is content to point out that the modern currency system has not developed because of any clear advantage in efficiency. The possibility that history provides attractive alternatives cannot be ruled out, and the question of which system is best remains both open and interesting.

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Federal Reserve Bank of St. Louis

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