

An hourglass-shaped graphic with a globe in the top bulb and another globe in the bottom bulb. The hourglass is light blue and has a dark blue top and bottom. The globe in the top bulb is dark blue, and the globe in the bottom bulb is light blue. The hourglass is centered on the page.

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Congressional Research Service

Report RL30904

*Why Is the Amount of Currency in Circulation Rising?*

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April 30, 2004

**Abstract.** This report explains that the amount of currency in circulation has been growing rather than decreasing. It appears that currency is far from becoming the really "small change" of the American monetary system. The analysis in this report suggests, however, that all is not quite what it appears to be. In fact, currency in circulation in the United States is becoming the small change of the American monetary system.

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## Why Is the Amount of Currency in Circulation Rising?

**Updated April 30, 2004**

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# Why Is the Amount of Currency in Circulation Rising?

## Summary

Currency is typically the small change of the monetary system, in the sense that it is used for small transactions. The continued spread of banking, electronic innovations in finance, such as ATMs, and the widespread use of credit cards have or should be expected to have reduced the need for currency. An examination of the data shows that this is not true. Dividing the amount of currency in circulation by the population of the United States shows that on a per capita basis currency rose from \$32 in 1929 to more than \$2,000 at the end of 2003. (If these data are adjusted for inflation, the per capita increase rises from \$320 to \$2,000.) This allocates to the typical family of four in 2003 about \$8,800 in currency. The growth in currency holdings has been especially rapid in the period subsequent to 1970.

A byproduct of this development has been a literature suggesting that these dollar holdings are used to finance a vast underground or irregular economy in the United States (as well as other countries). The transactions in this irregular economy are both legal and illegal. The legal activity conducted by cash, it is argued, is designed to avoid taxation. The illegal activity conducted by cash is to avoid the paper trail left by checks, thus making it harder for law enforcement authorities to detect the activity. While estimates of the underground economy made in the late 1970s and 1980s varied, they suggested it was sizeable. They implied that widely used measures of macroeconomic performance such as the rate of economic growth, the unemployment rate, and the inflation rate derived from official statistics were seriously deficient. The United States was better off than the official data suggested. However, using the estimation methodology popular in the 1970s to estimate the size of the irregular economy today yields an economy that is implausibly large — nearly three-quarters the size of official GDP.

Two developments caused some economists to question this methodology, in which currency plays a crucial role. First, a large and growing percentage of currency, now estimated by the Federal Reserve to be up to 70% of the total, does not circulate in the United States. Thus, it is not being used to finance the irregular economy in America. Second, the recorded statistics on bank deposits, also used in this methodology, understate the actual deposits used to transact business. And this understatement is growing. It has resulted from the innovative ways devised by bankers to get around the prohibition of paying interest on corporate checking accounts.

Thus, an argument can be made that the growth in currency outstanding really tells us very little about the U.S. economy. Of importance, currency comprises a very large part of one of the monetary aggregates (the monetary base) that various economists have argued the Federal Reserve should control in order to control aggregate spending. This report suggests that this advice may not be warranted. Congress should be alerted to the possibility that studies about a vast underground economy, massive amounts of uncollected taxes from this economy, seriously deficient national statistics, relationships between monetary aggregates and income, etc., may be based more on vivid imagination than on fact.

## Contents

The Behavior of the Currency Stock .....	1
Do the Data Provide Evidence of an Underground Economy? .....	6
Alternative Explanations for the Trend in the Currency Data .....	8
Bank Account “Sweeps” .....	8
Currency Held Abroad .....	8
The Currency That Circulates in the United States .....	10
Currency by Denomination .....	10
Currency and the Conduct of Monetary Policy .....	11
Conclusions .....	13
Appendix. The Data Sources and Their Manipulations .....	14

## List of Figures

Figure 1. Nominal and Real Currency in Circulation (billions of \$) .....	2
Figure 2. Nominal and Real Currency per Capita .....	4
Figure 3. Currency per Dollar of Disposable Income .....	5
Figure 4. Currency per Dollar of Demand Deposits .....	6
Figure 5. Percent of Currency Circulating Abroad .....	10
Figure 6: Change in Total Monetary Base .....	13

## List of Tables

Table 1. Growth Rates of the Currency Stock .....	3
Table 2. Rates of Growth of Per Capita Currency Holdings .....	4

# Why Is the Amount of Currency in Circulation Rising?

Currency is typically thought of as the “small change” of the monetary system of most developed countries. It is generally used by households (and perhaps by small businesses) for such purchases as fast food, products sold in vending machines, gasoline, laundry and dry cleaning, groceries, movies, etc. Increasingly, however, these purchases seem to be done by a combination of credit/debit cards and checks. Originally, the growth of deposit banking and the use of checks were a major force expected to decrease the use of currency. This was reinforced by the development and use of credit cards. In addition, the widespread availability of ATMs, made possible by the electronics revolution, should reduce average currency holdings.

As a result, one might expect currency to be increasingly chased out of the monetary system, supplanted by easier means of making payments. Yet this does not seem to be the case. In 2003, some \$646 billion in currency (and coin) were in circulation. This amounted to more than \$2,200 per resident of the United States. If this were taken literally, it would mean that the typical family of four held approximately \$8,800 in currency. And, as explained in the pages to follow, the amount of currency in circulation has been growing rather than decreasing. It appears that currency is far from becoming the really “small change” of the American monetary system. The analysis in this report suggests, however, that all is not quite what it appears to be. In fact, currency in circulation in the United States is becoming the small change of the American monetary system.

## The Behavior of the Currency Stock

**Figure 1** shows both the *nominal* value of the actual stock of currency and the value of that same stock expressed in *real* or 1999 prices.<sup>1</sup> The latter computation is made in the belief that the public holds currency for the services that it renders and the value of those services is measured by what those pieces of paper will buy (i.e., their real value) rather than by their face value.

Measured in nominal dollars, the currency stock rose from an average of \$3.9 billion in 1929 to an average of \$646 billion in 2003, an increase of about 16,600% over 74 years.<sup>2</sup> This is an average annual compound rate of growth of about 7.2%.

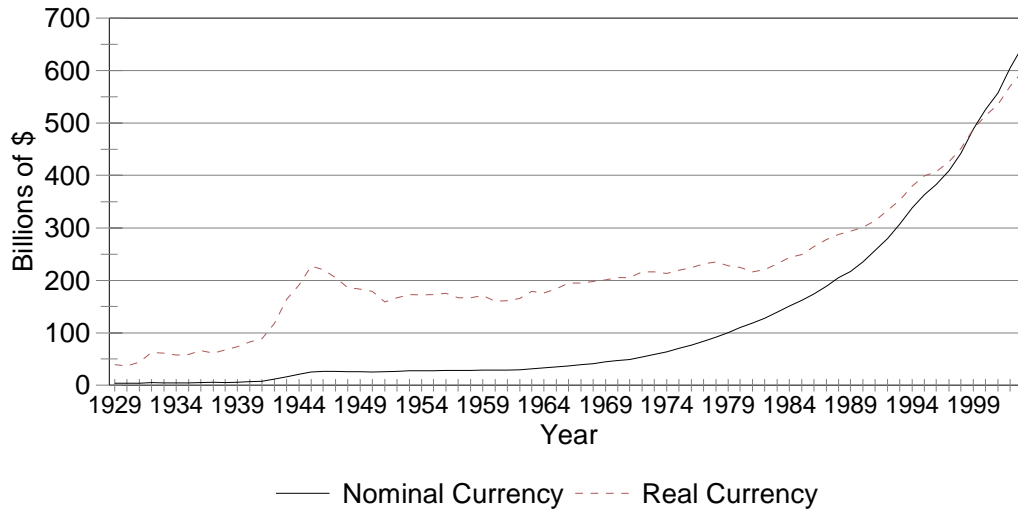
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<sup>1</sup> In this study, currency is defined to be notes and coins in circulation outside of the banking system and the government. Depository institutions hold currency as vault cash. While this is counted as their reserves, it is not included in this study as currency in circulation.

<sup>2</sup> The sources of the data and their manipulation for the purposes of this study are explained (continued...)

If it is assumed that prices were the same in 1929 as they were in 2003, the real value of the currency stock rose from \$39 billion in 1929 to \$598 billion in 2003, an increase of about 1,533% over 74 years. This translates into an average annual compound rate of growth of about 3.8%.

**Figure 1. Nominal and Real Currency in Circulation**  
(billions of \$)



**Source:** Federal Reserve, BEA.

The annual average compound rates of growth on a decade-by-decade basis for the two measures of currency are shown in **Table 1**. The growth rates of the real currency stock are quite interesting. For the 30-year period 1949-1979, the growth of currency was quite low. The growth rate for 1979-89 was double that of 1969-79 and the growth rate for 1989-99 was double that of 1979-89. One might have expected the reverse pattern to have occurred. The growth rate for the past four years is unchanged from the 1989-1999 period.

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<sup>2</sup> (...continued)  
in the appendix.

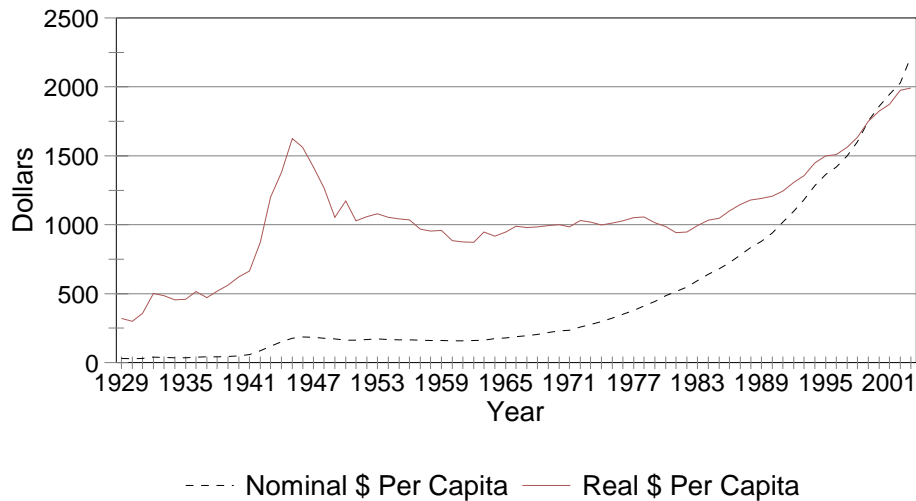
**Table 1. Growth Rates of the Currency Stock**  
(data in percentages)

	Nominal Currency	Real Currency
1929-1939	4.2%	6.6%
1939-1949	15.8	9.5
1949-1959	1.3	-0.7
1959-1969	4.3	1.6
1969-1979	8.5	1.3
1979-1989	8.0	2.6
1989-1999	8.4	5.2
1999-2003	7.2	5.2

**Source:** Federal Reserve, BEA.

Absolute numbers, while informative, can be made more meaningful if they are related to other variables such as population, income, and other means of making payments. **Figures 2-4** do that.

In **Figure 2**, the nominal and real measures of currency are expressed on a per capita basis. Per capita holdings of currency in nominal terms rose from an average of \$32 in 1929 to nearly \$2,200 in 2003, an increase of about 6,800%. In real terms, the increase was from an average of \$320 in 1929 to nearly \$2,000 in 2003, an increase of 525%. Using either measure, the data suggest that per capita currency holdings have risen considerably over this 74-year period. Although currency holdings have risen significantly in real terms, it is worth noting that they have always been much higher than one would expect.

**Figure 2. Nominal and Real Currency per Capita**

**Source:** Federal Reserve, BEA.

The average annual compound rate of growth of each of these two measures of currency on a decade-by-decade basis is shown in **Table 2**. Focusing on the real per capita measure is quite revealing. During the 30-year period 1949-1979, real per capita holdings either decreased or grew only slightly. This pattern was reversed over the past two decades, especially over the most recent decade, and continues over the past four years.

**Table 2. Rates of Growth of Per Capita Currency Holdings**  
(data in percentages)

	Nominal Currency Per Capita	Real Currency Per Capita
1929-1939	3.5%	5.8%
1939-1949	14.3	8.1
1949-1959	-0.5	-2.4
1959-1969	3.0	0.3
1969-1979	7.4	0.2
1979-1989	7.0	1.6
1989-1999	7.1	3.9
1999-2003	6.1	3.3

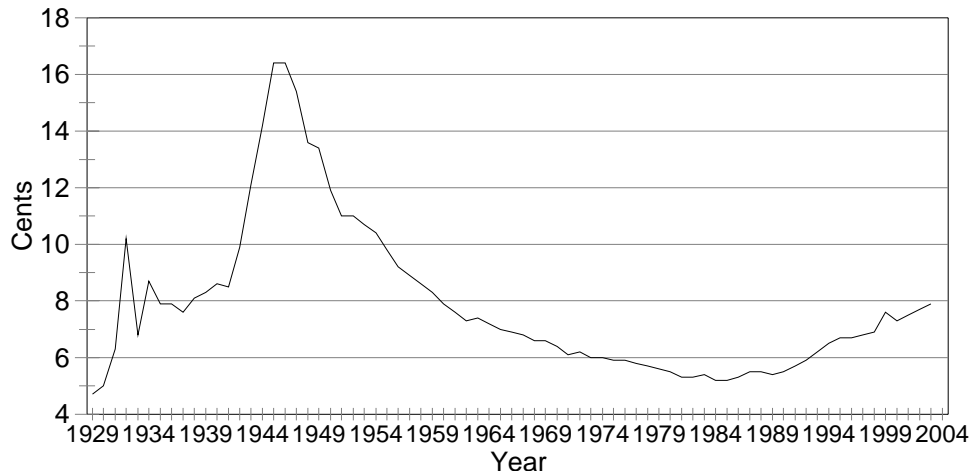
**Source:** Federal Reserve, BEA.

Since currency is undoubtedly held to make transactions, another relative measure of interest is the amount of currency held per dollar of disposable personal income, personal income being a measure of the ability of households and individuals



to make expenditures. These data are shown in **Figure 3**. They reveal that in 1929, currency holdings were about 4.7 cents per dollar of disposable income. This means that if a household's disposable income averaged \$1,000 a year, it would hold, on average, over that year, about \$47 dollars in currency. By 2003, households were holding about 8.0 cents per dollar of disposable income, or about 70% more than they held in 1929. Notice that currency holding relative to disposable income was particularly high during World War II and in the decade after the end of the war (this includes the Korean War period).

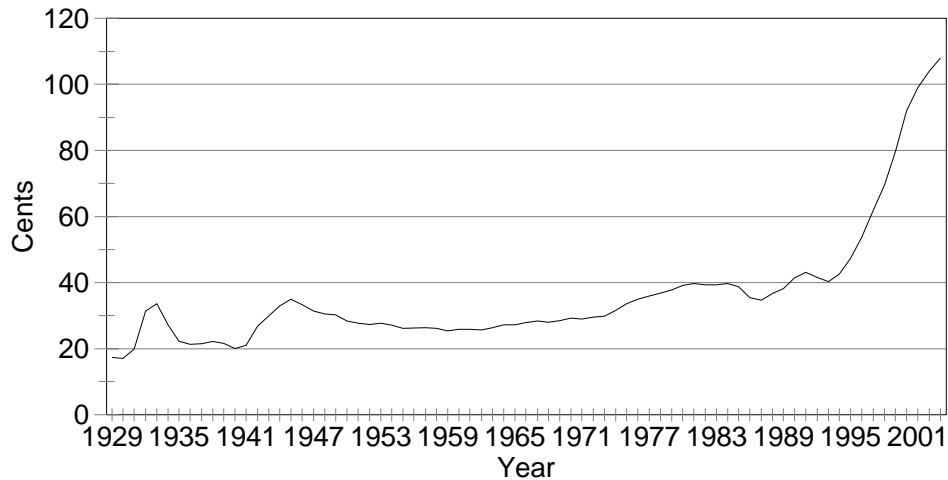
**Figure 3. Currency per Dollar of Disposable Income**



**Source:** Federal Reserve, BEA.

These data reveal that the amount of currency held relative to disposable income continued a slow decline into the mid-1980s. Then the amount held began to rise, and by 2003 it had increased by more than 50%. The development and widespread use and availability of credit cards and ATM machines might have been expected to have reduced these holdings considerably.

The final comparison, shown in **Figure 4**, consists of currency holding relative to all types of checking deposits. In 1929, the public held about 17 cents in currency for every dollar held as a checking deposit. This number rose dramatically during the Great Depression because of the banking crisis — nearly doubling by 1933. It then began to decline, only to rise again during World War II. In 1945, 35 cents in currency was held for each dollar of demand deposits. Relative currency holding then began a steady decline into the 1950s. It remained relatively stable from the early 1950s into the late 1960s. From that point on it began to rise, with the rate of increase being especially rapid during the 1990s. These data show that by 2003, the public held about \$1.08 in currency per each dollar held as a demand deposit. This is a startling development. It suggests that Americans (individuals and businesses) hold more in currency than they do in checking accounts. The increase in currency holding per dollar of demand deposits has been 523% over the period 1929-2003.

**Figure 4. Currency per Dollar of Demand Deposits**

**Source:** Federal Reserve.

## Do the Data Provide Evidence of an Underground Economy?

The major use made of these data has been to draw inferences about what is variously called the “underground,” “subterranean,” or “irregular” economy. There was and still is a belief that in the United States (and elsewhere) legal and illegal economic activity flourishes that is financed or facilitated by the use of currency. Currency, it is argued, is used in the conduct of legal activity primarily to avoid taxation. It is used in conducting such illegal activity as money laundering, gambling, drugs, etc., to escape detection by law enforcement authorities. In the 1970s, the size of this “irregular” economy began to interest economists.

An early, if not the earliest, measure of the size of this economy was made by Professor Peter Guttman.<sup>3</sup> Guttman’s measure of the 1976 economy depended on four assumptions: (1) The irregular economy uses only currency as a means of exchange. (2) During the period 1937-1941 there was no irregular economy. (This is then his base period.) (3) The ratio of *currency to demand or checkable deposits* during this base period is regarded as “normal” (or the ratio that would prevail thereafter were it not for the growth of the irregular economy). (4) A dollar of currency supports the same amount of economic activity in both the regular and irregular economy.

Using the data available at the time and applying this methodology, Guttman estimated from the amount of demand deposits in existence that the size of the irregular economy was about 10.4% of the officially recorded gross national product

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<sup>3</sup> Peter Guttman, “The Subterranean Economy,” *Financial Analysts Journal*, Nov./Dec. 1977, pp. 26, 27, and 34.

(GNP). He then drew a number of inferences from his study about the number of people employed in the irregular economy and the unreliability of the recorded statistics on GNP and unemployment.

Because of the rapid growth in the currency-to-deposit ratio recorded in the period subsequent to Guttman's study, especially the sharp rise during the 1990s, the application of his methodology to current data yields quite different results. Using revised data, the period 1937-1941 yields some \$212 in currency to every \$1,000 held as demand deposits. If this ratio is applied to the data on demand deposits for 2003, it yields about \$127 billion that would have to be held as currency to make transactions in the official economy. The remaining currency, then, according to Guttman's methodology, is used to finance the irregular economy. Actual currency holdings in 2003 averaged about \$646 billion, suggesting that about \$519 billion was used for the irregular economy. If the total of demand deposits and currency used in the regular economy (\$127 + \$600) generated a gross domestic product of \$10,988 billion, the \$519 billion in currency assumed to be used in the irregular economy would generate an "irregular GDP" of about \$7,844 billion. This is about 71% of the official economy as recorded in the National Income and Product Accounts.<sup>4</sup> Some basic evidence can be offered to suggest that the estimate for 2003 is wide of the mark. If employment per dollar of income in both sectors is the same, there would not be enough labor in the United States, even if the entire labor force were employed, to produce a combined GDP of \$18.8 trillion in 2003.<sup>5</sup>

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<sup>4</sup> Guttman's work was not without its critics. For an early critical review of his methodology, see Robert D. Laurent, "Currency and the Subterranean Economy," *Economic Perspectives*, Federal Reserve Bank of Chicago, Mar./Apr. 1979, pp. 3-6. Other economists at the Federal Reserve banks attributed the growth in currency to a hoarding desire by individuals. See Paul Anderson, "Currency in Use and in Hoards," *New England Economic Review*, Federal Reserve Bank of Boston, Mar./Apr. 1977, pp. 21-30; and David D. Whitehead, "Explaining the Cash Explosion," *Economic Review*, Federal Reserve Bank of Atlanta, Mar. 1982, pp. 14-18. For a more recent discussion of this topic, see Scott B. Sumner, "The Transactions and Hoarding Demand for Currency," *Quarterly Review of Economics and Business*, vol. 30, no. 1 (spring 1990), pp. 75-89.

<sup>5</sup> Guttman's paper and methodology are not the only attempt to estimate the size of the unofficial economy. Another notable effort was made by Professor Edgar Feige. An early paper by him is "How Big Is the Irregular Economy?" *Challenge*, Nov.-Dec. 1979, pp. 5-13. Feige's approach is somewhat less restrictive than Guttman's. Among his less restrictive assumptions is that 75% of the transactions in the irregular economy are effected by currency and the remaining 25% by checkable deposits. Feige also uses different methods to measure the economic activity in the irregular sector. These methods have changed over time. The simple application of his methodology produces an estimate of the irregular economy in the 1990s that is about twice as large as that estimated using Guttman's methodology. Feige's estimates decline by about one-half when they are adjusted to reflect the U.S. currency that circulates abroad. See his "The Underground Economy and the Currency Enigma," *Public Finance*, vol. 49 (1994), pp. 119-136. Another good collection of papers on this subject can be found in *The Underground Economy in the United States and Abroad*, ed. Vito Tanzi (Lexington Books, 1982) (see especially Part II); and U.S. Congress, House Committee on Ways and Means, Subcommittee on Oversight, *Underground Economy*, hearings, 96<sup>th</sup> Cong., 1<sup>st</sup> sess., 1979. A useful critique of these methods for estimating the size of the irregular economy can be found in Richard D. Porter (continued...)

## Alternative Explanations for the Trend in the Currency Data

As noted above, the size of the irregular economy in 2003 using the Guttman methodology is implausibly large. There have been developments in financial markets and in the use of currency which cause estimates such as those above to be of questionable value. Some of the innovations in financial markets have affected the use of demand deposits by businesses.

**Bank Account “Sweeps”.** While interest can be paid by financial institutions (primarily commercial banks) on checking deposits owned by individuals and some business and governmental units, it cannot be paid on the checking deposits held by most businesses, especially those organized on a corporate basis (see U.S. Code 371a). In order to attract and retain those deposits, banks have devised a number of means to, in effect, pay interest on them. In doing so, they affect the amount of those deposits recorded on the books of banks at the close of the business day (it is from the accounts at the close of the business day that the official statistics are recorded).

A common way to get around the prohibition is to allow business firms to make use of their demand deposits during the day, but to sweep the accounts of their funds at the end of the day and put them in a form on which interest can be paid (these are often money market deposit accounts, MMDAs). In addition, the high interest rates during the late 1970s and early 1980s led businesses to devise a number of money management strategies that allowed them to effect the same volume of transactions with a smaller average holdings of dollars, most of which would have been in the form of demand deposits.

Thus, a combination of banks desiring to pay interest on the demand deposit holdings by businesses and better money management techniques by businesses has resulted in a much slower rate of growth in demand deposits in the recorded statistics. This, in part, can explain the sharp rise in the ratio beginning in the 1990s shown in **Figure 4**. Thus, the currency-to-deposit ratio is of questionable value in calculating the size of the underground economy and with it the value of transactions involved in money laundering, illegal gambling, and the illegal drug trade. It does not explain, however, why the amount of currency in circulation has been rising.

**Currency Held Abroad.** Even more damaging evidence against this methodology is the admission by the Federal Reserve that perhaps as much as two-thirds of the currency in circulation *does not circulate within the United States*.<sup>6</sup>

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<sup>5</sup> (...continued)

and Amanda S. Bayer, “A Monetary Perspective on Underground Economic Activity in the United States,” *Federal Reserve Bulletin* (March 1984), pp. 177-189. See also David J. Pyle, *Tax Evasion and the Black Economy* (New York: St. Martin’s Press, 1989).

<sup>6</sup> In testimony before the Subcommittee on Domestic and International Monetary Policy, Theodore E. Allison, Assistant to the Board of Governors, stated: “We believe that as much  
(continued...)”

Official estimates exist only for the \$100 denomination notes held abroad. Counting only \$100 notes abroad, about one-half of U.S. currency is now held abroad, as shown in **Figure 5** (the fraction would be higher if smaller denomination notes abroad were included).<sup>7</sup> This represents an increase of about 66% over the 10-year period 1989 to 1998. (Since 1998, the percent of total currency held abroad has stabilized.)

This admission casts considerable doubt on the interpretation to be attached to the data contained in **Figures 2-4**, above.<sup>8</sup> In fact, when a currency-to-deposit ratio is calculated that considers both sweeps and the currency that is estimated to circulate abroad, it does not display the sharp rise during the 1990s that is evident in **Figure 4**. The revised ratio reaches a peak in about 1980 and then trends downward through the 1990s. The revised ratio is highly correlated with the yield on five-year Treasury securities (the correlation coefficient is 0.8) and fairly highly correlated with the yield on three-month Treasury bills (the correlation coefficient is 0.63).<sup>9</sup> This suggests that the ratio is highly sensitive to the “opportunity cost” of holding wealth in the form of money rather than to the possible activities in the irregular economy. Thus, it is both reasonable and prudent to conclude that early estimates of the size of the underground economy drawn from the growth of currency in circulation are now much too large. This is not to suggest that an irregular economy does not exist. Illegal activity flourishes, and the Internal Revenue Service points to the large disparity between its computations of adjusted gross income of individuals by type of income and the estimates of personal income made by the Bureau of Economic Analysis from the National Income and Product Accounts. This disparity also suggests that tax avoidance exists. The debate is over the relative size of these activities and how best to estimate their size.<sup>10</sup>

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<sup>6</sup> (...continued)

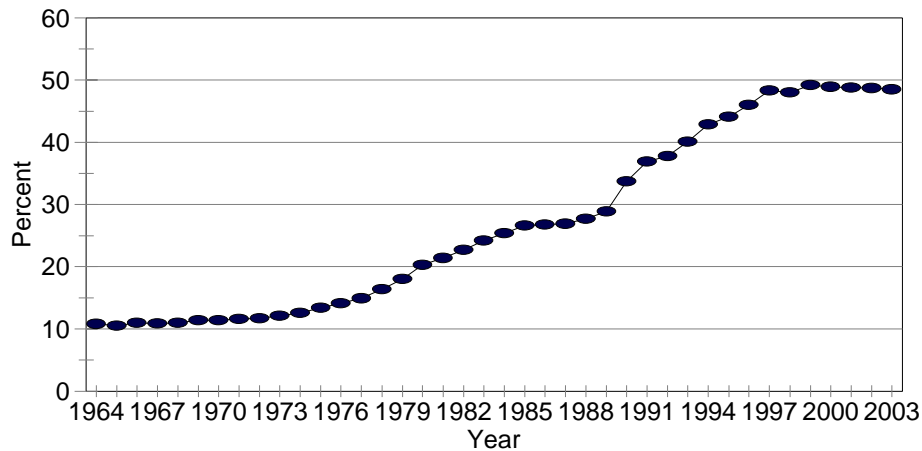
as two-thirds of all Federal Reserve notes in circulation ... are now held abroad” (Oct. 8, 1998). In March 2003, the Federal Reserve put the total held abroad at around 60%. See U.S. Treasury, *The Use and Counterfeiting of United States Currency Abroad, Part 2*, March 2003, p. iii.

<sup>7</sup> Although not quite so confident of the methodology when it is applied to bills whose denomination is \$50, the Federal Reserve nevertheless believes about one-half of them may also circulate abroad. See U.S. Treasury Department, *The Use and Counterfeiting of United States Currency Abroad*, January 2000. See also Ruth A. Judson and Richard D. Porter, *Overseas Dollar Holdings: What Do We Know?* Board of Governors of the Federal Reserve (unpublished), January 2001.

<sup>8</sup> This is not to say that the United States does not gain from foreigners holding U.S. currency. These holdings represent an interest-free loan from foreigners to the United States. If currency were not held abroad, the U.S. Treasury would have had to issue an equal amount of interest-bearing debt. For more on this issue, see CRS Report 98-998 E, *Euro Currency: How Much Could It Cost the United States?* by Gail Makinen.

<sup>9</sup> For the actual computations see Richard Porter and Gretchen Weinbach, *Currency Ratios and U.S. Underground Economic Activity*, Board of Governors of the Federal Reserve System, July 1998.

<sup>10</sup> For the most recent discussion of this topic and estimates of the gap, see Mark Ledbetter, “Comparison of BEA Estimates of Personal Income and IRS Estimates of Adjusted Gross (continued...)”

**Figure 5. Percent of Currency Circulating Abroad**

**Source:** CRS calculations based on Federal Reserve data.

## The Currency That Circulates in the United States

When the currency stock is adjusted for the amount that is thought to circulate abroad, a substantial residual remains for domestic circulation, estimated from Federal Reserve data to average about \$1,170 per capita. Surveys of the composition of household wealth conducted periodically by the Federal Reserve place average per capita currency holdings at a little more than \$118.<sup>11</sup> There is, then, a considerable amount of currency held domestically that cannot be explained. Some have creatively called this “the case of the missing money.” Nothing precludes some of this money from being held to finance an underground economy. The Federal Reserve has an ongoing research effort to explain these holdings as well as to provide a more comprehensive estimate of the amount held abroad.

### Currency by Denomination

Not only has the amount of currency in circulation risen dramatically, but so has the percentage of the total consisting of \$100 denomination notes (the largest notes in circulation). These notes constituted 25.2% of the total in 1972. They rose to 41.8% in 1982 and to 56.3% in 1992. In 2003 they were 70.8% of the total. Those who believe in a vast underground economy cite this growth as evidence in support of their view.

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<sup>10</sup> (...continued)

Income,” *Survey of Current Business*, Apr. 2004, p. 8.

<sup>11</sup> The last survey that collected data on currency holdings was conducted in May 1995. Updating currency holdings from then to 2003, using the consumer price index, yields approximately \$118, assuming individuals hold the same real value in currency in 2003 as they did in 1995.

Part of the increase in the share of \$100 bills in circulation may reflect the effect of inflation, however. Inflation not only has an effect on the amount of currency held by the public, but it can also affect the composition of currency holdings. Suppose, for example, that the price level increased tenfold between period 1 and period 2. Individuals who held a \$10 bill to make a transaction in period 1 would now need to hold \$100 to make the same transaction. This could be done with ten \$10 bills or one \$100 bill. Physical constraints such as the size of the wallet or purse would argue in favor of the substitution.

Some evidence supporting substitution can be found in the fact that over the 21-year period 1979-2000, the amount or face value of currency in circulation rose about 400% while the *number* of notes in circulation of denomination \$1 through \$100 increased by about 176%. Thus, consumers held 400% more currency to finance transactions in 2000 than they did in 1979, but they held only 176% more notes. This is possible only if the average value of the notes rose (i.e., larger denomination notes were substituted for multiple smaller denomination notes). This substitution was undoubtedly aided by inflation. Over this 21-year period, the consumer price index rose about 140%. Thus, the mere presence of more higher-denomination notes in circulation need not indicate much about the size or growth of an underground economy. It may be more suggestive of the effect inflation has on the physical ease of making transactions.

## Currency and the Conduct of Monetary Policy

There has long been a debate among academic economists over the tool the Federal Reserve should use to conduct monetary policy. For most of the past 20 to 30 years, the Federal Reserve has conducted monetary policy by manipulating short-term interest rates. In particular, it has manipulated the federal funds rate, which is an overnight rate that banks charge each other for the use of excess reserves. This rate typically influences other short-term interest rates, and the current and expected short-term rates influence the behavior of long-term rates. A number of economists have argued that this method has gotten the Federal Reserve into trouble from time to time. A better way to conduct monetary policy, they argue, is to target the growth rate of the “money supply.” If a stable and predictable relationship exists between the money supply and money spending, they argue, the latter could be controlled more closely through control over the supply of money than by manipulating interest rates. This group of economists engaged in a research strategy to show that such a stable relationship exists for several different measures of “money” and money spending.<sup>12</sup> Unfortunately for their policy recommendations, the stable and

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<sup>12</sup> While it is doubtful that the Federal Reserve ever conducted monetary policy by manipulating the growth rate of a monetary aggregate, it did in the period subsequent to 1973 set monitoring ranges for three measures of the “money supply”: M1, M2, and M3. It terminated the range for M1 in 1990, and for M2 and M3 in 2000. This reflected the fact that the growth rates of these aggregates did not bear a close and stable relationship with the growth rates of money spending. The controversy over the relationship of these aggregates to spending is still far from over. For a recent discussion, see Milton Friedman,

(continued...)

predictable relationship shown by their empirical studies broke down for at least two of the popular monetary aggregates.<sup>13</sup> Increasingly this group has come to focus on the relationship between the so-called monetary base and money spending.<sup>14</sup>

It is curious that the monetary base – money spending growth relationship is stronger than for the other monetary aggregates, since more than 90% of the base is composed of currency (the remainder consists of the reserves of the banking system) and an increasing proportion of the currency component over the past 20 years is held abroad. This suggests that developments abroad have a stronger relationship to aggregate spending in the United States than do domestic measures of money, in which currency plays a much smaller role. It also suggests that the historically stable relationship between this monetary variable and domestic spending may not continue to perform well in the future as more and more currency winds up owned by foreigners. In **Figure 6**, the growth rate of an estimate of the domestic monetary base (the total base less the amount of currency represented by \$100 denomination bills that are estimated to circulate abroad) is contrasted with the growth rate of the total monetary base for the period 1980-2003. These two measures of the base have different turning points and rates of change over the 23-year period, although their movements are quite similar from 1998 to 2003. This follows since the share of U.S. currency held abroad has been fairly constant from 1998-2003.<sup>15</sup>

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<sup>12</sup> (...continued)

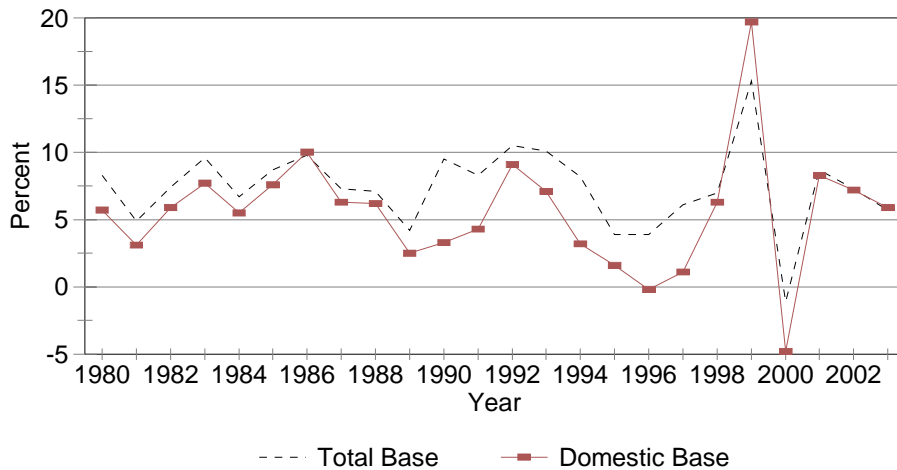
“Monetarist Thoughts,” *Journal of Economic Perspectives*, vol. 14, no. 4 (fall 2000), p. 225. See in the same issue of this journal “Response from Bradford De Long,” p. 227.

<sup>13</sup> See CRS Report RL31416, *Monetary Aggregates: Their Use in the Conduct of Monetary Policy*, by Marc Labonte and Gail Makinen.

<sup>14</sup> A leader of this group, Professor Milton Friedman, put this view succinctly: “The Federal Reserve has one monetary aggregate it can control. This is the base. That is what it operates on, and that is what it could do something about. If the Federal Reserve is to be held accountable, then we ought to look at the base. Period!” See Milton Friedman, “Recent Behavior of the Velocity of Money,” *Contemporary Policy Issues*, vol. V, no. 1 (Jan. 1987), p. 10. In deference to Professor Friedman, this statement was written 17 years ago. He may not hold such a view today.

<sup>15</sup> The domestic monetary base is a falling percentage of the total monetary base. In 1964, the first year in the post-World War II era that the Federal Reserve reported currency held abroad, the domestic base was about 92% of the total base. By 1998 it had declined to about 56% of the total, roughly where it has remained through 2003. If foreign holdings of smaller-denomination currency could be estimated to the satisfaction of the Federal Reserve and thus included in the *Flow of Funds* estimates, the domestic base would probably have fallen to about 40% of the total base in 1998.



**Figure 6: Change in Total Monetary Base**

**Source:** CRS calculations based on Federal Reserve data.

## Conclusions

The common-sense view that currency is the “small change” of the monetary system is correct. It is used for minor household and business transactions. It may even be held to provide safety against an uncertain future. This being the case, it is hard to explain the large amount of U.S. currency in circulation at the end of 2003, which would amount to about \$8,800 per family of four, more than the average demand deposit held by individuals and businesses. This is hardly small change.

For that reason, individuals, including economists, have investigated the uses made of this currency. They once concluded that it financed or facilitated a vast underground economy where both legal and illegal activities flourish. This underground activity supposedly costs the government tax revenue and casts doubt on the meaning to be attached to national statistics that measure the macroeconomic performance of the economy.

These conclusions are now suspect because the underlying methodology used to estimate the size of the underground economy assumes that all this currency circulates and is actively used in transactions in the United States. This is untrue. A substantial and growing amount circulates abroad. Estimates by the Federal Reserve suggest that currently this may account for much as 70% of the currency in circulation. While other data and methodologies suggest that an underground economy exists, especially that related to illegal activity, it is considerably smaller than that estimated by currency-based methodologies.

Given the diminishing proportion of the total currency stock that circulates in the United States, the common-sense perception that currency is, indeed, the small change of the American monetary system appears to be correct.

## Appendix. The Data Sources and Their Manipulations

**Disposable Personal Income.** Bureau of Economic Analysis, Department of Commerce. The annual numbers incorporate all revisions through December 2003. The annual numbers represent a measure of disposable personal income that is centered on the mid-year. For analytical purposes, similar measures of the components of the money stock and population are required.

**Currency.** For the period 1941-2000, the data are from the Board of Governors of the Federal Reserve. The data for 1929-1940 are taken from Table A1 in the *Monetary History of the United States* by Milton Friedman and Anna J. Schwartz. For the period 1959-2003, the yearly observations are the average of the currency in circulation in December of the year in question and December of the preceding year. For 1929-1958, it represents the currency in circulation as of the end of June of the relevant year. In either case, the currency estimate is centered on mid-year.

**Demand Deposits.** The data for 1929-1940 are taken from Table A1 of the *Monetary History of the United States*. The data for 1941-2003 are taken from the Board of Governors of the Federal Reserve. They have been manipulated in the same way as the currency numbers above. It should be noted that the demand deposit data for the period 1959-2003 are not strictly comparable with the data for 1929-1958. The former series omits some deposits included in the later series. Thus, the 1959-2003 data are slightly smaller each year than those for the earlier period.

**Population.** U. S. Bureau of the Census. The annual population is that reported for July 1 of each year.