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Deficits, Inflation, and Monetary Policy

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Deficits, inflation, and monetary policy

Monetary policy in most countries has been misguided in recent years. First, tight policy has been used to “counter” fiscal deficits. Second, monetary policy has become increasingly focused on inflation fighting as its primary goal. Third, the belief that no country can “go it alone” has led countries to adopt similar, tight, policy in the belief that this will placate financial markets. Ironically, this is precisely the opposite result from that claimed for a flexible exchange-rate system. I will argue that there is little evidence that fiscal deficits generate inflation that needs to be fought through tight monetary policy; that tight monetary policy is largely responsible for pervasive and persistent fiscal deficits; that monetary policy actually has little effect on measured inflation rates; and that the abandonment of the Bretton Woods system has contributed to pressures to adopt austere policy. I will conclude with alternative policy recommendations. Note that most of the evidence examined is taken from the United States; it is hoped that the analysis will be extended to the other countries.

Virtually all developed capitalist economies have consistently incurred government deficits in recent years. According to conventional (neo-classical) wisdom, these deficits “crowd out” private investment through higher interest rates¹ and generate inflation; higher inflation (or

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¹ Many economists (both orthodox and nonorthodox) argue that there simply is no credible evidence to support the crowding-out thesis. Arestis and Bain (1994) show that in the case of the United Kingdom, the evidence since 1979 is inconsistent with the beliefs that deficits raise inflation or interest rates. Seccareccia and Sharpe (1994) find no evidence that rising Canadian government deficits have increased interest rates, inflation, or exchange rates. Foster (1994) and Smithin (1994) find no evidence that U.S. government deficits have raised interest rates or inflation.

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inflation expectations) pushes nominal interest rates higher still. Thus, conventional wisdom advocates tight monetary policy to counteract the supposed inflationary impacts of fiscal deficits; if inflation falls, this can allow nominal interest rates to fall below what they otherwise might have been in the presence of fiscal deficits. It is claimed that, given persistent deficits, the hands of the central bank are tied—tight money policy is the fault of errant *fiscal* policy and not the fault of the central bank. At one time, it was promised that tight policy could fight inflation with only minimal impact on employment and real economic growth—a claim that was important in justifying Federal Reserve Chairman Volcker's extremely tight policy in the early 1980s.

The belief that the central bank must offset any expansionary effect of fiscal deficits relies on a belief that, in the absence of fiscal deficits, the economy would produce full employment of all resources; otherwise, such deficits should not automatically produce inflation through an overheated economy. Further, there must be some sort of mechanism whereby monetary policy affects significantly and primarily nominal prices. A decade ago, it was commonly believed that the central bank determines the money supply, which then directly determines prices. This is no longer tenable, as shown by the fact that attempts by central bankers around the world to target monetary aggregates were overwhelmingly unsuccessful; further, correlations between monetary aggregates and inflation fell apart in many countries in the 1980s. The conventional wisdom now—a wisdom articulated by some central bankers—is that the central bank directly determines the rate of inflation. According to Hans Tietmeyer, president of the Deutsche Bundesbank, "Among central bankers there is today a virtual consensus that price stability should be the primary objective of monetary policy."² In almost identical language, current Fed Chairman Alan Greenspan claims, "Owing to the increasing evidence of the deleterious effects of inflation, in recent years there has emerged a growing consensus throughout the world that a monetary policy geared towards the pursuit of price stability over time is the central bank's most significant contri-

² Lecture given in Kiel, September 26, 1994. He goes on to quote Alexandre Lamfalussy approvingly: "Monetary policy is working: in all countries inflationary trends are under control, and in quite a number of them price stability is within sight." Not only should monetary policy focus on inflation, it should be congratulated for recent low inflation. Central bankers appear to believe that if this mantra is recited frequently enough, it will be believed even in the absence of any credible analysis to show that central bankers deserve such credit.

bution to achieving maximal growth of a nation's well being."³ The "transmission mechanism" between monetary policy and inflation has yet to be identified, but it seems to be based on the older "Keynesian" notion that tight money leads to restrictive credit conditions, which translates to less lending and lower spending. Again, for this to affect nominal prices primarily and directly, rather than real employment and output, deviations from full employment must not be persistent or large. In any case, because inflation has declined in most countries over the past decade and has remained low in recent years, central banks are quick to accept credit for disinflation. The apparent correlation between low inflation and central bank "inflation targeting" apparently confirms the belief that the central bank is responsible for prices—even if it is not clear *how* monetary policy impacts inflation.⁴

In addition to the belief that persistent fiscal deficits "force" tight monetary policy, the current exchange-rate system is also believed to "force" austere monetary policy. Abandonment of the Bretton Woods system in the early 1970s and movement to flexible exchange rates were supposed to free central banks from the need to coordinate monetary policy. Each country would be free to pursue independent monetary policy—a precondition to adoption of inflation targets—while market forces would determine exchange rates. Flexible exchange rates would allow rapid adjustment to market forces, eliminating trade surpluses or deficits. The results, however, have not been as advertised.

International coordination of monetary policy has *increased*; virtually all countries adopted monetarist tight policy in the early 1980s, and the belief that no central bank can "go it alone" to pursue expansionist policy has become pervasive. Commentators now argue that any country that adopts independent policy will be punished by a flight from the currency. Actual currency flights have become common, forcing international coordination by central banks. Tight monetary policy in most of the developed countries over the past decade and a half has led to chronically high unemployment and lower economic growth (when compared with the first two decades following World War II). It has

³ "Testimony by Alan Greenspan before the Committee on the Budget, U.S. House of Representatives, June 22, 1994."

⁴ Like Tietmeyer, Greenspan is quick to accept accolades for successful management of policy: "The Federal Reserve's policies in recent years also have helped to damp inflation and inflation expectations" (Board of Governor's Report to the Congress on the Full Employment and Balanced Growth Act of 1978, February 22, 1994).

also raised interest rates, increased government spending, and reduced tax revenues—leading to higher government deficits. Indeed, most of the OECD countries would recently have attained balanced budgets were it not for interest expenses on outstanding debt. I will attribute much of the recent budget problems precisely to mismanagement of monetary policy over the past several decades and will contrast this experience with that of the early postwar period, when monetary policy—at least in some countries—more appropriately strove for lower interest rates and proper management of government debt. Thus, in contrast to the claims made for flexible exchange rates, monetary (and fiscal) policy has consistently opted for austerity—lowering average growth rates around the world. And it is not clear that such policy deserves the credit for low inflation.

The policy implications are clear: (1) return central banks to a less active role that abandons attempts to “fine-tune” the economy; (2) “monetize” a greater proportion of government debt through central bank “purchases”; and (3) restrict central bank functions to those traditionally associated with central banking—namely, determination of the government borrowing rate and lender of last resort activity.

Deficits and inflation

Orthodoxy argues that deficits tend to be inflationary. But orthodoxy argues that *monetized* deficits are surely even more inflationary because of the widespread belief that money causes inflation; this is used as an admonition against central bank monetization of deficits through accommodative policy. Three objections can be raised. First, as mentioned earlier, in the United States, the correlation between monetary aggregates and inflation disappeared—a result that holds no matter which definition of money supply is used (indeed, the correlation is negative for M1). The evidence on the money–inflation relation is simply overwhelmingly against the naive monetarist view: Money does not cause inflation. What is more important, government deficits tend to be “monetized” no matter what the central bank does. This is because most—about 60 percent—U.S. federal debt is bought by financial institutions, which create money as they issue liabilities to finance their positions in government bonds. Somewhat perversely, tight monetary policy actually *increases* the portion of government debt in private bank portfolios—as the economy slows, banks stop lending and purchase safer assets, including government debt. This effect was particularly

pronounced in the last U.S. recession, during which financial institutions were blamed for creating a “credit crunch” precisely because they chose to monetize the deficit rather than to lend. Thus, if anything, tight policy induces banks to monetize a greater percentage of the fiscal deficit. It is therefore rather misleading to focus on central bank monetization and ignore financial institutions, which are relatively more important in this regard. Third, if the central bank has a fed funds target, its open market operations are necessarily *defensive*. When the Treasury “deficit spends,” the Fed *must* supply reserves as the Treasury writes a check on its Fed account. For reasons discussed below, the quantity of government debt privately held is determined by the level of reserves that must then be drained from the system to hit the overnight borrowing rate.

It is still possible, of course, that government deficits are inflationary—for reasons that have nothing to do with monetization. Government deficits might place two kinds of pressure on prices, one coming from the demand side and one coming from the supply side. If resources are fully employed, any extra demand would cause input prices to rise, which could be expected to be passed on in the form of higher prices. If the government’s budget were essentially unconstrained because it could run deficits, then it would continue to compete with the private sector as the economy moved beyond full employment, leading to continuous inflation.

We can also identify two kinds of supply-side price pressures. If the government spending led to bottlenecks for particular inputs (highly skilled engineers, certain natural resources), this could increase the costs of these inputs at least temporarily. Presumably, any price inflation resulting from bottlenecks would be short-lived as markets adjusted by increasing the supply and/or through input substitution. Another supply-side source could result if fiscal deficits did lead to crowding out of private investment, leading to lower growth of capacity and productivity; if demand continued to grow so that it outpaced the growth of supply, inflation could result. This was part of the Supply Side arguments popularized under Ronald Reagan in the United States and Margaret Thatcher in the United Kingdom. Further, if government activities were somehow perceived as onerous by private agents, and if this then reduced private initiative, this would also reduce growth of supply. However, this supply-side effect is not due to a deficit, *per se*, but to government activity that could occur regardless of the presence of deficits. Indeed, Supply Siders argued that nothing demoralizes entrepreneurs more than taxes, which led to the tax cuts that generated massive deficits under Reagan. These tax cuts were supposed to raise the efforts of entrepreneurs suffi-

ciently that aggregate supply would rise, raising income and increasing government revenue enough to balance the budget.⁵

Demand-side inflationary pressures cannot have played much role in the U.S. case since World War II, except for a brief period during the Vietnam War, because otherwise our economy consistently operates far below full capacity (of labor or capital). Between 1959 and 1993, the average capacity utilization rate of manufacturing in the United States was only 82 percent; it reached as high as 85 percent only twice since 1974 (never reaching 85.5 percent)—what is often called “practical full capacity,” as it is recognized that the economy cannot operate at 100 percent of capacity for long. However, it is noteworthy that, even during a short burst of activity, the economy only rarely reaches the capacity utilization rate that conventional economists suppose should be sustainable over the long run. Supply-side pressures arising from bottlenecks have undoubtedly led to substantial but isolated price increases. It is difficult to argue, however, that constraints have prevented markets from responding to these bottlenecks over periods as long as several decades. Even if inflation from bottlenecks *were* important, the solution would *not* be tight money. In the case of primary commodities, a bufferstock policy could help to stabilize prices (see Davidson, 1994). In the case of bottlenecks of other inputs, policies to increase supply (rather than to reduce aggregate demand) would be more sensible. In short, the conditions required for continuous inflation pressure arising from fiscal deficits have not been operative in the United States. Thus, it should not be surprising that the empirical evidence against an inflation-deficit relation is strong in the U.S. case. Massive and persistent U.S. deficits since the early 1980s have been associated with first falling and then persistently low inflation rates.⁶

Deficits and interest rates

At least for the United States, then, the empirical support for the conventional view is weak: Government deficits seem to cause neither high interest rates nor inflation. Further, while government deficits tend to be monetized, money does not seem to play a causal role regarding

⁵ The actual results were quite different, but both candidate Bob Dole and President Bill Clinton endorsed many of the same arguments.

⁶ Empirical evidence of a deficit–inflation link is difficult to find. See Smithin (1994), Arestis and Bain (1994), Wray (1989), and Seccareccia and Sharpe (1994).

inflation; nor, I might add, does inflation appear to determine nominal interest rates.⁷ Most important, high interest rates appear to be the conscious result of central bank policy. Similarly, nominal rates can be brought down by central bank policy if the bank so desires.⁸

The orthodox story misses important “reverse causation” elements. First, high interest rates that result from tight monetary policy can actually be inflationary—at least temporarily—because they raise costs. This is clearest for the case of the financed durables component (appliances, autos) of the consumer price index (CPI). But higher interest rates affect all firms—most importantly, by raising the costs of short-term finance (for example, of the wage bill). Second, as I have shown, high interest rates can increase the rate of growth of the money supply and bank lending precisely because higher costs must be covered through greater bank advances.⁹ Thus, a central bank that ostensibly targets monetary aggregates can actually force growth rates to rise above target levels as it tightens policy—exactly the position faced by the Federal Reserve in the early and mid-1980s—generating perverse signals that cause it to tighten further, perversely increasing the rate of growth of the money supply as interest rates rise!¹⁰ This effect is broken only when interest rates rise sufficiently to induce a financial crisis (through effects on bank balance sheets as well as income-flow effects as debtors devote increasingly large portions of income to debt service).

Finally, the conventional wisdom ignores an important reverse causation phenomenon that has proven to be of critical importance: High

⁷ For example, through a Fisher effect, the empirical evidence for which is quite weak (see Papadimitriou and Wray, 1994).

⁸ This is most true for short-term rates, but prior to February 1994, the Fed had succeeded in lowering long rates also. While I agree with Smithin (1994) that the direction of causation has run from central bank policy to high interest rates to greater fiscal deficits, I do not adopt the “horizontalist” endogenous money approach in which the central bank sets short-term interest rates and long-term rates are determined solely by expectations of future central bank policy. Interest-rate determination is much more complicated.

⁹ Further, because of effects on bank balance sheets, higher interest rates may induce them to attempt to grow fast to restore solvency. This is because liabilities have shorter maturity than assets; the way to restore a profitable interest-rate differential between assets and liabilities is to increase holdings of new (higher-earning) assets as quickly as possible. See Wray (1993a; 1994).

¹⁰ Indeed, my empirical analysis of the postwar period showed that the correlation between interest rates and rate of growth of the money supply was higher than that between inflation and money growth—the latter a correlation upon which a whole school of thought was based. The empirical correlation between money growth and

interest rates increase government deficits through direct and indirect impacts. A high interest rate increases government interest expenditures, adding directly to the government deficit. As this increases borrowing and the outstanding debt stock, these interest payments become a permanent component of the government budget that can be reduced only by lowering interest costs (this depends on the maturity structure and the ruling interest rate) or by running government surpluses that allow a portion of the debt to be retired. If high interest rates slow the economy, then the deficit is indirectly increased as tax revenues fall and certain types of spending rise (such as transfers) (see Foster, 1994; Smithin, 1994). The impact is compounded when rates are rising due to the nature of the balance sheets of financial institutions—since assets are usually of longer maturity than liabilities, rising rates reduce net worth and can induce insolvency. Under common institutional arrangements, this can force financial institutions to reduce lending—especially to private firms. For example, capital adequacy requirements lead regulators to force banks to cut lending as rates rise and destroy net worth; where government debt is treated more liberally with regard to capital requirements (for example, in the case of risk weighting, or where government debt is counted as a secondary reserve), this can induce banks to substitute government debt for private lending (as discussed above) when tight money raises interest rates. As private lending declines, spending declines, lowering government revenue and increasing the fiscal deficit.

The direct effects of high-interest-rate policy are significant in every OECD country, as Table 1 shows. Column 1 shows the overall budget balance as a percentage of GDP in 1992; all countries but Japan had

interest rates is strong and positive; indeed, this correlation is stronger than that between inflation and the rate of growth of M1. For the period 1948–89, the correlation of changes of M1 with the commercial paper rate was 0.47, 0.59, and 0.67 for contemporaneous, one-year lagged, and two-year lagged values of money. Over the whole period, the correlation between the rate of growth of M1 and changes in the CPI is 0.26, 0.37, and 0.42 for contemporaneous, one-year lagged, and two-year lagged, respectively. The correlation disappears (or even turns negative) during the later postwar period (1966–89). While the correlation between inflation and the interest rate is strong for the whole sample and for the later period, this correlation during the early (pre-1966) postwar period is not so close; this is not surprising: Various constraints helped to restrain interest rates so there seems to be no evidence of a “Fisher effect” during the first period. Furthermore, the strong correlation between inflation and interest rates in the second period is a result of a complex interaction among inflation, interest rates, and the rate of growth of the money supply. Rising inflation and rising interest rates *cause* the money supply to grow faster.

Table 1
Government deficits and primary balances (in percentage of GDP, 1992)

Country	Budget balance	Interest payments	Primary balance
United States	-4.7	2.2	-2.5
Japan	1.3	0.4	1.7
Canada	-5.8	5.5	-0.3
Germany	-3.2	2.6	-0.6
France	-2.8	2.6	-0.2
Italy	-11.1	10.9	-0.2
United Kingdom	-6.6	2.1	-4.5
Belgium	-6.1	9.8	3.7
Denmark	-2.6	3.7	1.1
Portugal	-5.4	9.1	3.7
Spain	-4.7	3.3	-1.4
Greece	-13.2	13.6	0.4

Source: UNCTAD, *Trade and Development Report* (1993), p. 75.

significant deficits. Column 2 shows government interest payments as a percentage of GDP—ranging as high as 11 percent for Italy and nearly 14 percent for Greece. Finally, column 3 shows the primary balance, which is a country's general budget balance net of interest payments on government debt. Most countries would have achieved balanced budgets if not for interest payments. While Italy, Belgium, Portugal, and Greece incur interest payments on government debt to an amount equal to approximately 10 percent of GDP, or more, all of these have achieved a positive primary balance (or, primary surplus), or nearly so. Indeed, both Portugal and Belgium achieved primary surpluses equal to 3.7 percent of GDP—twice as much as that of the next largest primary surplus (Japan, at 1.7 percent). As we will see in a moment, such austere budgets can be self-defeating if they slow the country's growth rate.

These figures indicate that central bankers must share at least part of the blame for deficit problems in almost every country. It is at least partly a case of monetary policy irresponsibility and not solely a case of fiscal irresponsibility that has led to a situation in which government interest payment on debt reaches as high as 5 percent or even 10 percent of GDP.¹¹ Indeed, irresponsible central bank policy forces irresponsibly austere fiscal stances that can lead to lower economic growth rates.

It is easy to show that central bank policy regarding government

¹¹ The case of Italy is instructive—its deficit is 11 percent of GDP, of which interest payments account for virtually the whole deficit; this is for an outstanding debt that is approximately equal to its 1992 GDP (actually, 108 percent of GDP). At that time,

borrowing costs is an important determinant of debt-to-GDP and deficit-to-GDP ratios.¹² Assume a country begins with a debt-to-GDP ratio of 100 percent (a situation similar to that of Italy, and not too dissimilar from that of many OECD countries); assume the government borrows at an interest rate of r by issuing debt with a maturity of one period (so that when the interest rate changes, interest payments on all debt outstanding are affected immediately) to finance its deficit, Def ; assume the government maintains a primary balance (tax revenues, T , are always sufficient to cover all government spending, G , except interest on debt, $r(Debt)$); assume tax revenues are equal to a constant fraction of GDP; and assume GDP grows at a rate of g . Then the initial conditions can be represented as:

$$(1) \quad T_0 = t(GDP_0);$$

$$(2) \quad Debt_0 = GDP_0;$$

$$(3) \quad Def_0 = G_0 - T_0 = r(Debt_0).$$

Thus, the initial deficit-to-GDP and debt-to-GDP ratios are:

$$(4) \quad \frac{def_0}{GDP_0} = \frac{r(GDP_0)}{GDP_0} = r;$$

the yield on government bonds was 11.5 percent, with an inflation rate of 5.4 percent—or an inflation-adjusted interest rate of more than 6 percent. Nominal GDP was growing at 5.7 percent. At the time, the OECD calculated that, given this interest rate and rate of growth of GDP, Italy would have to attain a primary surplus equal to 6.3 percent of GDP in order to hold the debt-to-GDP ratio at its 1992 level. A more recent projection was that Italy's primary surplus would reach about 3.5 percent by the end of 1995. UNCTAD had calculated that with a balanced budget by 1993, Italy would have had to achieve a nominal GDP growth rate of nearly 16 percent in order to meet the Maastricht debt target (60 percent of GDP) by 1997, or a growth rate of 10.4 percent to reach it by 1999. Clearly, with high-interest-rate policy at the central bank combined with a balanced budget, such growth rates are impossible.

¹² The following analysis is based on Wray (1996); it is somewhat similar to that of Domar (1944); however, in some sense, the model presented here is the "reverse" of Domar's and asks an opposite question. That is, Domar was concerned with a case in which the government borrows only to finance "investment-type" expenditure, while taxes cover interest payments. He then held the interest rate constant to ask what the "debt burden" would be given different economic growth rates. In contrast, I model the case that is currently relevant in which the government has a "primary" balance but is forced to borrow to cover interest payments; the interest rate is then a policy variable under control of the central bank. Given our different purposes, it is not surprising that our models and conclusions are somewhat different.

$$(5) \quad \frac{Debt_0}{GDP_0} = 1.$$

At the end of the first period, government spending, tax revenues, deficits, government debt, and GDP are:

$$(6) \quad G_1 = t(GDP_1) + r(Debt_1) = t(GDP_0 + g[GDP_0]) + r(GDP_0 + Def_1);$$

$$(7) \quad T_1 = t(GDP_1) = t(GDP_0 + g[GDP_0]);$$

$$(8) \quad Def_1 = G_1 - T_1 = r(GDP_0 + Def_1) = \left(\frac{r}{1-r}\right)GDP_0;$$

$$(9) \quad Debt_1 = GDP_0 + Def_1 = \left(1 + \frac{r}{1-r}\right)GDP_0;$$

$$(10) \quad GDP_1 = GDP_0 + g(GDP_0) = (1 + g)GDP_0.$$

Thus, the debt-to-GDP and deficit-to-GDP ratios at the end of the first period are:

$$(11) \quad \frac{Debt_1}{GDP_1} = \frac{\left(1 + \frac{r}{1-r}\right)}{1 + g} = \frac{1}{1 + g};$$

$$(12) \quad \frac{Def_1}{GDP_1} = \frac{\left(\frac{r}{1-r}\right)}{(1 + g)}.$$

Since the debt-to-GDP ratio was equal to one, by assumption, initially, this ratio will change unless

$$(13) \quad g = \frac{r}{1-r}.$$

This means that the interest rate on government debt must be less than the growth rate of the economy to avoid a rising debt-to-GDP ratio. When

$$(14) \quad r > \frac{g}{(1 + g)},$$

both the debt and deficit ratios will rise. Extensions of this analysis would show that, if austere budgets do not slow the growth rate of the economy (g), then movement toward a primary surplus would allow higher interest rates without increasing debt and deficit ratios. However, in the more likely case, raising tax revenues or reducing noninterest government spending (that is, increasing the primary surplus) should be expected to lower the growth rate of GDP. In this case, it is easy to see that austerity can actually increase the debt and deficit ratios for any given interest rate by slowing economic growth. Alternatively, given a growth rate that is a function of the fiscal stance, the maximum permissible interest rate consistent with stable deficit and debt ratios is thereby reduced. In other words, tight fiscal policy *requires* easy money policy to *avoid* a rising “debt burden.”

Indeed, with a debt-to-GDP ratio of 60 to 100 percent (a range within which virtually all countries fall) and with a GDP growth rate of 3 to 6 percent, governments cannot hold debt ratios constant, or balance budgets, unless monetary policy becomes more accommodative so that interest rates can fall. For many countries, the surest way to cut the deficit is to reduce interest rates; this will also have the indirect effect of lowering deficits through expansion of the economy. At the same time, the surest method to increase deficits and debt ratios may be to impose austerity in the form of tight monetary policy and fiscal retrenchment designed to increase primary surpluses. It is easy to see that the orthodox policy recommendation according to which central banks should tighten to counteract deficits could lead a country like Italy or Greece onto a path of ever larger deficits, rising debt-to-GDP ratios, and rising interest payments as a percentage of GDP.

Inflation and monetary policy

As mentioned above, there is a growing consensus that central bankers can and should control the rate of inflation. Since 1979, the Fed has adopted a number of targets of monetary policy, all of which were purported to be linked in some manner with the rate of inflation, which would thus allow the Fed to reduce inflation as it moved toward its stated goal of achieving “stable prices.” However, it is not clear how “stable prices” would be measured; some (such as Jordan, 1993) have advocated pegging the CPI. However, close analysis of the components of the CPI raises serious doubts that it is an appropriate measure of inflation for policy purposes; further, the impact of tight policy could easily be perverse

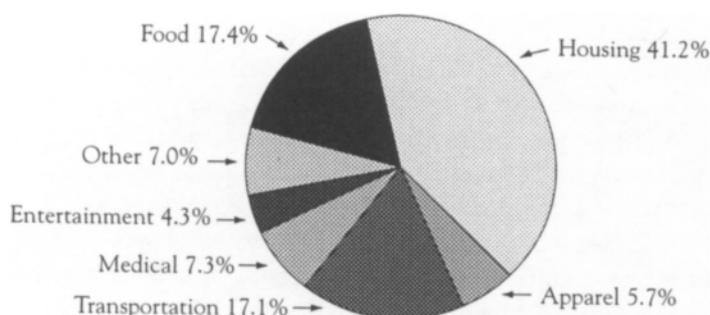
in that it might *increase* the measured inflation rate. It is my conclusion that the CPI is not a good guide for the conduct of policy, nor is it likely that the recent low inflation achieved in the United States is a result of monetary policy.¹³

The primary index used to measure U.S. inflation is the CPI, which tracks prices of a consumer basket. Because baskets change over time, the Bureau of Labor Statistics' Consumer Expenditure Survey establishes a "benchmark" to assign *component weights* used for the next decade or so. The benchmark now used is based on surveys conducted during 1982–84, while new weights are currently being established through surveys and will be used beginning in 1998. The *relative importance* of each component reflects the "nominal" portion of expenditure devoted to each item in the consumer basket—assuming the component weights do not change (see figure 1 for major categories of 1994 relative importance). Briefly, this is calculated by multiplying each component weight by the price index for the component, then dividing by the CPI. Relative importance will grow for any item that experiences an above-average rate of inflation, while the relative importance of items with below-average inflation will fall. In research undertaken with Dimitri Papadimitriou, I have developed a measure of the *weighted contribution* of each item to measured CPI inflation to provide an estimate of the contribution of the inflation of each individual item in the basket to the inflation of the CPI. This is calculated by taking the change of the component's index, multiplying by a component weight, and dividing by the change of the CPI. As would be expected, the sector(s) with higher inflation dominates increases of the CPI; *weighted contribution* is a measure of the degree to which the inflation of individual components causes inflation of the CPI.

We found that three components accounted for most of our inflationary pressures during the 1970s and early 1980s; reduction of inflation in these three sectors accounts for most of the disinflation since the mid-1980s. These are food, transportation, and housing—during peak inflationary periods, these have a combined weighted contribution approaching 90 percent; housing alone accounts for half (see figure 2). Further, excluding food and petroleum "price shocks," most recent inflation comes from the service sector (commodities typically have inflation rates well below average) whose relative importance increases

¹³ The following discussion is based on a Levy Institute Public Policy Brief (Papadimitriou and Wray, 1996).

Figure 1 Relative importance to CPI inflation of various components, 1994



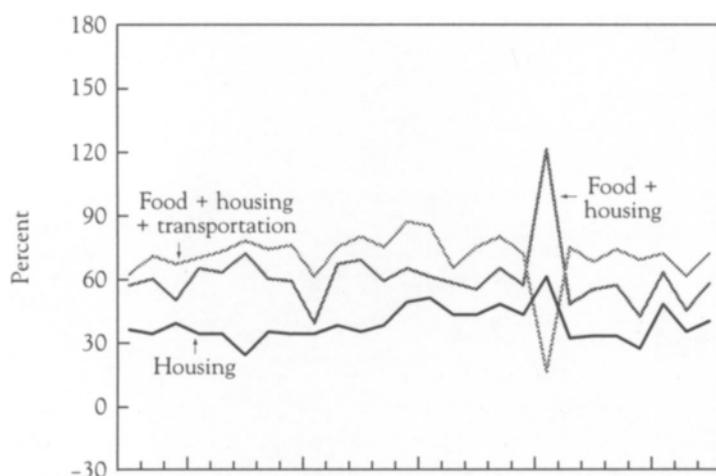
Source: U.S. Department of Labor, Bureau of Labor Statistics, *Relative Importance of Components in the Consumer Price Index*, annual, various years.

over each decade. This general picture is not consistent with the conventional wisdom, according to which tight policy raises finance costs, reducing demand and inventories, since the effect should be much greater on commodities. In reality, inflation rose then fell primarily because the rate of price increase of services rose then fell; since commodities declined in importance, it takes an increasingly large impact on them to reduce inflation caused by the service sector. By far the most important component of the service sector is housing—its relative importance in the CPI is currently above 40 percent and its weighted contribution was 50 percent when inflation was high. Thus, this sector warrants closer examination, as it is possible the Fed's inflation fighting worked primarily through housing; indeed, many would list the interest rate-housing sector relation among the most important transmission mechanisms of monetary policy. However, this misinterprets how the housing sector index is calculated.

I am primarily concerned with the shelter component, which accounted for 28 percent of the 1994 CPI (or more than two-thirds of the housing sector relative importance); of this, renters' costs account for 8 percent and homeowners' costs account for nearly 20 percent.¹⁴ The majority

¹⁴ The method currently used—imputed rental cost—has been in place since 1983. Previously, the BLS tried to calculate user cost of housing, but it was believed that the older method mixed investment and consumption features of homeownership

Figure 2 Weighted contribution to CPI inflation of food, housing, and transportation, 1968–93

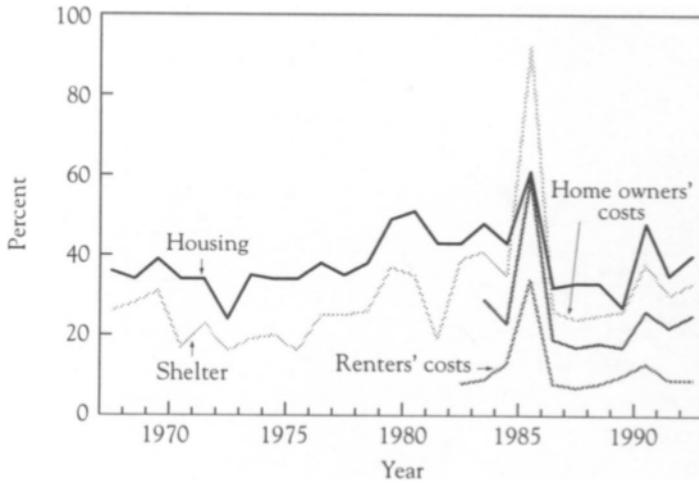


Source: Author's calculations based on data from U.S. Department of Labor, Bureau of Labor Statistics, *Relative Importance of Components in the Consumer Price Index*, annual, various years.

of renters' costs is residential rent (5.8 percent), while the majority of homeowners' costs is the owners' equivalent rent (OER, 19.5 percent). The BLS uses a survey of rentals to calculate changes of rent. The method used for OER is more complicated. Field agents ask owners for the rental price the homeowner believes the house could rent; agents may enter their own estimate if they believe the owner's is unreasonable. These data are used to establish base year imputed rent; the rate of increase of OER is obtained by applying the rate of increase of prices of rental units that are similar in certain respects (location, structure type, quality). Note that the rental market for single-family detached housing (SFDH) is small (15 percent of SFDH) and distinct from that for owner-occupied SFDH (85 percent of SFDH). Thus, the rate of increase of the *rental* portion of the market—a portion that is small and that *may not* represent a good substitute for the large part of the market—generates

(Gillingham, 1980). To some extent, the older method resulted in a measure of inflation that was more appropriate for the purposes of monetary policy formation. However, it should be noted that, since rising interest rates raise mortgage service costs, tight money policy would perversely impact housing-sector inflation even in the pre-1983 period. (See Pollin and Stone, 1981, for a comparison of the two methods—which lead to widely different estimates of housing-sector inflation.)

Figure 3 Weighted contribution to CPI inflation of the housing sector, 1968–93



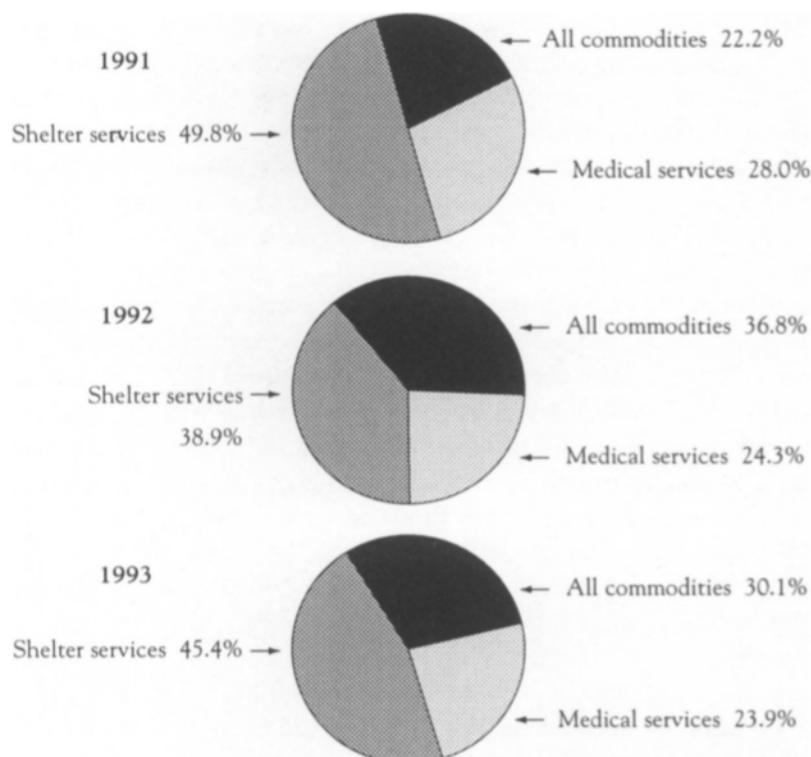
Source: Author’s calculations based on data from U.S. Department of Labor, Bureau of Labor Statistics, *Relative Importance of Components in the Consumer Price Index*, annual, various years.

estimates of the rate of increase of the *owner-occupied* portion of the market.

As figure 3 shows, it is the shelter component (primarily renters’ costs and OER) that drives housing-sector inflation. The weighted contribution of shelter rose steadily in the last half of the 1970s until it accounted for more than 37 percent of CPI inflation in 1980. In recent years, shelter has accounted for about one-third of measured inflation; indeed, as figure 4 shows, during the early 1990s, shelter-services inflation contributed far more to inflation than did the *entire* commodities sector. The Fed’s most recent tightening would have to work primarily on housing and medical services inflation because commodities contributed so little to the overall inflation rate. Given the large weight of housing, if monetary policy does not reduce inflation coming from housing, or more specifically from shelter, it will have a difficult time reducing inflation in the present environment.

Several questions about the use of the CPI as a measure of inflation follow. For instance, assume that due to limited supply of rentals relative to demand, the rent of SFDH rises rapidly. This leads to high inflation of residential rent and thus imputed OER. This can occur independently of the course of prices of owner-occupied SFDH (whether new or used),

Figure 4 Weighted contribution of relative shares of all commodities, medical services, and shelter services to CPI inflation, 1991, 1992, 1993



Source: U.S. Department of Labor, Bureau of Labor Statistics, *Relative Importance of Components in the Consumer Price Index*, annual, various years.

as well as independently of the *quantity* or *cost* of current construction of such housing. Given the 1994 relative importance of shelter (over 28 percent) in calculation of the CPI, inflation of rentals is transmitted to the CPI, inducing the Fed to adopt tight policy. Those who might have been considering the purchase of SFDH postpone purchase due to high interest rates and rent in the meantime. This increases the excess demand for rentals, raising the rate of inflation of rentals *and* of the imputed OER, further increasing CPI inflation and generating a vicious cycle of interest rate hikes and depressed real estate markets for SFDH, but *rising* rents and imputed rents (OER). Furthermore, higher interest rates could

be passed along by landlords—further exacerbating “inflation.” Certainly this is not sustainable, but the point is that the *transmission mechanism* of monetary policy fails to resolve the balance in a small part of the market for SFDH that transmits *imputed* price increases to the large market for such dwellings which becomes destabilized by the policy. Further, the central bank obtains incorrect signals by focusing on the CPI, and policy moves markets further from equilibrium (since one solution would be to *lower* interest rates to encourage home purchases). One can envision other situations in which the housing sector generates incorrect signals for, and responds “incorrectly” to, Fed policy.

This analysis casts doubt on the impact of monetary policy on inflation of the housing component of the CPI. While there may still remain a link (for example, due to the impact on new construction or on mortgage rates that affect demand), this will be transmitted to *measured* inflation rates only indirectly and with lags (units remain in the base for as long as a decade). Indeed, the impact could be perverse. Finally, there is no reason to suppose that inflation as measured by the CPI accurately reflects market conditions for owner-occupied housing. Thus, housing inflation as measured for the CPI is both a poor indicator to be used in policy formation and unlikely to be affected in the desired direction by policy. To reemphasize, housing represents more than 40 percent of the CPI, and two-thirds of this is rental or imputed rental costs wherein lie the problems. Given questions about this sector, as well as well-known volatility in the food and energy sector, the CPI is not a good measure of inflation for the conduct of policy, as these three sectors account for an overwhelming portion of measured inflation. Nor is it clear that the Fed deserves *any* credit for the disinflation of the 1980s or for recent low inflation. While Fed inflation fighting has contributed to slow growth, it is not at all clear that this has contributed in any major way to low inflation. In other words, it is not clear that there has been any “tradeoff” of slow growth for low inflation.¹⁵

Abandonment of Bretton Woods and worldwide stagnation

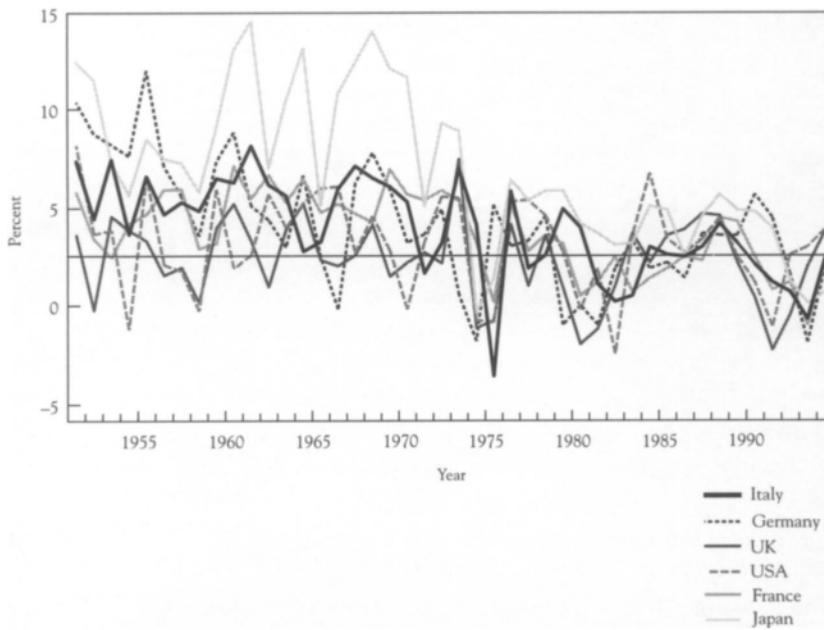
Paul Davidson (1992–93, 1994) has provided a detailed examination of the impact of the breakdown of the Bretton Woods system. Rather than

¹⁵ This analysis has investigated only the U.S. case. While inflation rates have fallen around the world, I cannot make the claim that monetary policy elsewhere does not deserve any credit merely by extrapolating from the U.S. case. Further detailed, cross-country, analysis is required.

duplicating his efforts, I will merely provide a brief summary. In a comparison of three different exchange-rate systems (the fixed exchange rate—gold standard, the fixed-but-adjustable Bretton Woods system, and the current dirty-float system), Davidson finds that the Bretton Woods system led to vastly greater economic performance of both the developed and developing countries. Real GDP growth and the rate of growth of productivity were much higher, prices were more stable, and unemployment was lower. This indicates that it is not just a fixed-exchange-rate system that is required—because the gold standard achieved that—but a method for providing a flexible *quantity* of international reserves and for “refluxing” these to needy countries is also required. The Bretton Woods system provided this in the early postwar years *almost* as a coincidence. Any reformation of the international monetary system must deal explicitly with a method for adjusting international reserve flows in a manner that does not place the entire burden for adjustment on deficit nations. Both the Keynes (1980) “bancor” plan and the Davidson plan do precisely this by forcing the surplus nations to “use them or lose them” (international reserves, that is).

In contrast, the current system does precisely the opposite: It creates strongly stagnationist international pressures. Because of relaxation of capital controls, the shift to flexible exchange rates, innovation, and globalization of international finance, countries worldwide are forced—or at least believe they are forced—to adopt similar money policy stances as those followed in the United States, Germany, and Japan. Since 1980, virtually all developed countries have experimented with monetarism. Certainly other factors have been important—including abandonment of the Bretton Woods system—but the evidence on international (inflation-adjusted) growth rates clearly indicates that tighter monetary policy and resulting high interest rates have led to slower growth. Figure 5 shows that the postwar period can be divided into the early period, which lasts until 1973, and the late period after 1973. In the early period, growth rates were high and displayed some variability among countries; in the late period, all growth rates converge to a much lower average. The degree of convergence shown in figure 5 is indeed striking. Of course, the initial “shock” to growth rates (in 1974–75) is often attributed to higher oil prices. But it is remarkable that the slower growth is persistent and universal. Probably of greater importance has been the abandonment of Bretton Woods and capital controls, gradual abandonment of “Keynesian” fiscal policies after 1970, and adoption of

Figure 5 Inflation-adjusted growth rates, 1951–94, selected countries



the monetarist religion in most countries.¹⁶ Because of central bank fear of economic growth, all countries adopt tight policy whenever there is evidence that robust growth is beginning. Thus, while high-interest-rate policy of the central bank is not the sole cause of slower economic growth, it plays an important role. Further, at least in the case of the United States, much more aggressive intervention by the central bank since the mid-1980s has not only had a negative impact on economic growth but also led to much greater instability in financial markets. Greenspan's first tightening in the spring of 1987 generated the October stock market crash that led to \$1 trillion of losses; his most recent tightening led to the bond market bust and \$1.5 trillion of losses.

During the confirmation hearings on Greenspan's reappointment as chair of the Federal Reserve Board of Governors, Senator Tom Harkin carefully reviewed the record of each postwar chairman. He found that

¹⁶ See Wray (1994–95) for an examination of U.S. abandonment of Keynesian policies after 1970. As Davidson argues, economic results since abandonment of Bretton Woods have been substantially less favorable; this is not just due to the greater instability of exchange rates, but is also due to the absence of a method to "reflux" international reserves.

the first four chairmen (McCabe, Martin, Burns, and Miller) presided over the Fed with real GNP growth rates of 6.1 percent, 3.6 percent, 3.3 percent, and 4.5 percent per year. In contrast, Chairman Volcker's growth rate averaged just 2.5 percent, while Chairman Greenspan's has averaged only 2.2 percent. As the Senator argued,

Using a comparison analysis, Mr. Greenspan's stewardship at the Fed is lacking, compared to those who came before him. That 2.2 percent growth rate is abysmal when you look at the growth rates under previous Chairmen. But I find it difficult to accept this low of a growth rate with minimal reductions in inflation—[from] 4.1 percent [when he came into office] to 3.2 percent [currently].¹⁷

The high (and unstable) interest rates are justified as being necessary to fight high inflation in order to placate international financial markets. These have generated exceedingly low growth rates since 1973, but particularly since 1979 when Volcker took over. If the Fed had indeed successfully fought inflation, the "pain" might have been worthwhile. As Senator Harkin points out, however, Greenspan came in at a low rate of inflation and has inflicted considerable pain with very little success at lowering inflation further. While Harkin is willing to give more credit to Volcker, my analysis above shows that most of Volcker's "success" was merely due to the way in which the housing component of the CPI is calculated. In other words, the "pain" appears to have been unnecessary for the entire period since 1979.

It is particularly ironic that central bankers now claim they are subject to the whims of international finance: A primary neoclassical argument in favor of flexible exchange rates was the supposed freedom this would give each central bank to pursue independent monetary policy. A country would not be forced to adopt austerity in the case of a trade deficit, as currency depreciation would quickly close the deficit. As experience has shown, however, any country that appears to grow faster than is believed to be "sustainable" is "forced" to adopt austerity to prevent a run from its assets. With no anchor for exchange rates, countries are doubly punished: Not only does the fear of inflation generate nearly permanent austerity policy but, even with tight money policy, no individual country has the power to stop a speculative run no matter how high interest rates are pushed. The only hope is to convince markets that the central bank will never let the economy

¹⁷ Senator Tom Harkin, from the *Congressional Record*, June 14 1996, p. S6286.

grow at anything approaching growth rates that were common two decades ago.

Even without a thorough reformation of the international financial system (along the lines of Keynes' or Davidson's proposals), if central banks will just abandon the silly notion that inflation is the economy's worst enemy and that every economic expansion must be fought to try to induce "soft landings," economic growth will be much higher. Orthodox economists seem to have successfully advanced the notion that there is some magic "sustainable growth rate" at which the economy can be held without inducing inflation, and that any growth rate above this is unsustainable and inflationary. This is just the "natural rate" hypothesis revamped as growth theory. In the United States, orthodox economists have proclaimed that the sustainable growth rate is about 2.5 percent; thus, whenever the economy exceeds this, the Fed is supposed to tighten. A quick perusal of figure 5 shows that if the Fed had done this in the early postwar period, the United States would have foregone much of its economic growth. I have placed a line (labeled "sustain") in figure 5 to emphasize that virtually all countries enjoyed highly "unsustainable" growth rates for more than two decades after 1951. The conventional wisdom at the Fed would place a low ceiling on economic growth, cutting off every cyclical peak in the vague hope that this would also limit the troughs (which are claimed to result from the inflation that occurs at the peaks). This used to be called Keynesian fine-tuning when the bastard Keynesians advocated use of fiscal policy to accomplish precisely the same thing. Stagflation was supposed to be the death knell for bastard Keynesians and fine-tuning, and it is strange that no one accuses monetarist inflation fighters of attempted fine-tuning. "Sustainable growth" is an exceedingly weak and vague concept on which to hang a country's fortunes, and it is clear from figure 5 that attempts to achieve "sustainable growth" have merely led to persistently substandard growth rates.

Advocates of central bank fine-tuning argue that supply constraints invariably appear whenever growth exceeds "sustainable" levels. But it is obvious that it is demand and not supply that is constraining world economic growth. Growth rates were much higher through 1973, when supply constraints must have been much more important than they are today. With the tremendous development of western Europe in the early postwar period, and with rapid development in the less developed countries, the newly industrialized countries, and the "Asian tigers," it is silly to argue that supply is today more constraining than it was in the

1960s. In fact, the world “suffers” from tremendous excess manufacturing capacity—a problem compounded by falling real living standards of most Americans since 1973. The real problem facing the world economy is slow growth caused by inadequate demand, itself partially a result of austerity programs adopted on the justification of inflation fighting. There is, of course, a great deal of hysteresis built into the system: Low aggregate demand and slow growth lead to low levels of investment and innovation, which then lower demand further and constrain potential supply. High and persistent unemployment—such as that currently experienced in France and Spain—leads to loss of “human capital” and can destroy the desire to engage in productive activity. The longer the world economy suffers slow growth, the more difficult it becomes to escape; further, long periods of slow growth can generate the supply constraints that orthodox economists already imagine.

Of course, just as central banks cannot escape some of the blame for government deficits, neither should they be held entirely responsible for budget problems. Particularly in the case of small, open economies, central bank policy is constrained by policy undertaken by the dominant countries. This is especially true in the case of European countries that are trying to maintain exchange rates within agreed-upon bands. By 1992, expectations of an Italian currency devaluation were so great that the central bank believed it had to maintain high interest rates to offset expected capital losses on lira-denominated debt. This does not absolve the Bank of Italy of all blame, for interest rates could have been lower to that point; lower interest rates might have reduced speculation that the lira would be devalued by reducing pressures on prices (high interest rates raise costs) and making Italian products more competitive internationally.¹⁸ Thus, while it is true that international considerations can constrain the feasible policy alternatives, there is, and has been, room for movement within these constraints.

Alternative monetary policy

The first central banks were established to provide government finance; this is because governments were constrained in their ability to borrow

¹⁸ Seccareccia and Sharpe (1994) similarly argue that Canadian central bank austerity policies lowered Canada’s competitiveness, generating a “twin deficits” problem. A trade deficit can then lead orthodox economists to call for government deficit reduction on the pretense that this will enhance productivity of the private sector.

and could not issue fiat money¹⁹ (Goodhart, 1989; Knapp, 1924). One of the earliest central banks was the Bank of England, specifically created to buy the debt of the English Crown so that it could conduct a war with France. The Bank of England would issue notes denominated in a sterling pound unit of account to finance its position in Crown debt. This essentially allowed the Crown to *indirectly* issue money-denominated IOUs; it must be emphasized, however, that the Bank of England was doing nothing out of the ordinary when it issued pound-denominated notes—all private banks could “create money” by issuing notes denominated in the unit of account whenever they made loans. It was only the Crown that could *not* issue pound-denominated IOUs and that was constrained by the amount of gold it could obtain for coinage.

In England, private banks outside London (“country banks”) had already pyramided reserves on London—in other words, they made their IOUs convertible on demand into London bank notes (Sayers, 1957). When all London banks save the Bank of England were prohibited from issuing notes, it became quite natural to make country bank notes convertible into Bank of England notes. Eventually, the Bank of England became the preferred *reserve bank*, with its liabilities serving as the ultimate *reserve* for the liabilities of all other private banks. As such, a *mono-reserve* system was created with the liabilities of the Bank of England serving as the reserve for all private banks (Bagehot, 1927). The Bank of England became the *de facto central bank*—all capitalist countries developed a similar arrangement with a central bank at the top of the debt pyramid (Foley, 1989).

After the creation of central banks, it took several centuries to understand that they *should* act as lenders of last resort (Bagehot, 1927). Narrow self-interest would appear to dictate that the central bank should actually refuse to lend whenever there is a run on private banks lower in the pyramid precisely because these are facing financial difficulty. And, in fact, the Bank of England would cut off lending whenever a run developed during its first two centuries of existence; this would virtually ensure that private banks would not be able to convert their liabilities into central bank liabilities. However, by the late nineteenth century it was recognized that central banks *must* provide their reserves without limit during such panics in order to stop runs. Over time, the mono-reserve system has led to the conventional view that central banks can control private bank lending through control over bank reserves. This

¹⁹ See Wray (1993b, 1993c) for more details on the history of central banking.

gradually developed into the view that the central bank is ultimately responsible for the quantity of money; in the past two decades, this led to the incredible notion that central banks set the inflation rate.

An alternative—Keynesian—view stresses the unit of account function of money, the nature of monetary production, and the role of the central bank at the apex of the debt pyramid. In this view, money has no direct relation to inflation of the prices of *current* output, and the central bank has no direct control over the “money supply” or over inflation. Rather, money is the unit of account in which liabilities are denominated and the only “price” the central bank can influence is the *floor*, spot, price of liabilities. The only way the central bank can lower “inflation” of the prices of current output is by pushing interest rates higher, lowering investment (the production of capital assets) and other spending, raising unemployment, and causing aggregate demand to falter. But even this may not halt inflation unless it causes a recession so severe that firms decide that further price increases would negatively affect demand more than they would increase profits.

In the modern capitalist system, the government believes it “finances” deficits by selling government bonds—many of which end up in private portfolios. As discussed above, orthodox economists fear central bank purchases of bonds because these are believed to increase reserves, thus, to increase the money supply through the money multiplier—in turn causing inflation. Actually, the sale of government bonds to the public should be seen as a process designed to allow the central bank to hit interest rate targets, while the “financing” of the deficit is nothing more than an internal accounting procedure. To make this clear, it is perhaps best to begin with the assumption that the central bank is the initial “purchaser” of all government bonds—as *was* the case in the early years of the Bank of England. The Treasury “writes checks” drawn on the Fed, which are then credited as reserves of private banks; the Fed offsets this liability with a government bond—clearly this “financing” is nothing more than an internal accounting offset (Mosler, 1995). The Fed then sells government bonds to banks (as well as to the nonbank public) to provide them with an earning asset (always preferred over nonearning excess reserves and excess paper notes). Thus, sale of government bonds to private holders is nothing more than a “reserve drain,” and *not* a financing operation. These sales are done to maintain a positive overnight rate (e.g., fed funds rate), for otherwise excess reserves would drive the rate toward zero. What appears to be a government financing operation (sale of bonds to the public) is actually an interest-rate-maintenance

operation. The government can “borrow” (issue debt to the public) at any interest rate the central bank chooses to enforce. It is relatively easy for the central bank to peg the interest rate on a short-term government debt instrument by standing ready to purchase it at a fixed price in unlimited quantities. This is precisely what the Fed did in the United States until 1951—providing banks with an interest-earning alternative to excess reserves, but at a very low rate of interest.

After 1951, the Fed tried to fine-tune the economy and especially set out to offset any stimulative fiscal stance through countercyclical monetary policy. In other words, rather than pegging the price of bonds, the Fed tried to manipulate the fed funds rate in a countercyclical manner through a countercyclical reserve drain. As I showed (1993a), given various institutional constraints that existed in the early postwar period, the Fed was able to induce a credit crunch by raising short-term rates only slightly. As these constraints were removed (due to deregulation and innovation), it took increasingly larger interest-rate hikes to have much impact on spending. This greater instability is required because small interest-rate hikes now have virtually no impact on aggregate demand—indeed, they merely increase lending and cause the rate of growth of the money supply to rise; at the same time they can even increase the rate of inflation (by raising costs). There is no credible evidence that, for moderate interest rate hikes, there is a negative relation between rates and investment spending (Fazzari, 1993). The conventional market wisdom in the United States is that it takes a hike of at least 450 basis points to affect spending—a wisdom that conventional economists still do not recognize. And the primary “transmission mechanism” now appears to be the impact of rising rates on balance sheets. As rates rise, financial institutions become insolvent and debtors devote ever larger portions of cash flows to debt service. It is this cash-flow effect that reduces the demand for loans, and the portfolio effect that reduces the supply. Recent experience in the United States confirms this wisdom.

If the Fed and the Treasury will recognize that central bank policy in modern capitalist economies merely determines the interest rate banks can earn as an alternative to nonearning excess reserves, and will recognize that bond sales maintain this at a positive level (rather than providing “government finance” of deficit spending), then perhaps it will be possible to move beyond the belief that the Fed must “fine-tune” the economy using the overnight lending rate, and that it must “offset” deficits by pushing this rate up. An alternative policy would reduce

central bank interventions and direct the central bank away from fine-tuning. While other interest rates will fluctuate with economic conditions and expectations, a low and stable base rate will impart greater stability to all interest rates.

This will also return the central bank to its original purpose—provision of government finance at reasonable terms. As discussed, in the modern economy, the Fed determines what interest rate banks can earn by giving up reserves; there is no longer any need to provide “government finance” because the public willingly accepts fiat money in exchange for the goods and services it provides to the government.²⁰ This will reduce the deficit and reduce government interest payments—which might allow some of the hysteria about deficits to subside.²¹ Finally, the central bank cannot abandon its most important function—lender of last resort activity. A concerted effort by central banks to lower interest rates will help to restore higher growth rates. In addition, reformation of the financial system along the lines of the Keynes *bancor* plan would help remove stagnationist tendencies (Davidson, 1992, 1994). As mentioned above, even without such international coordination, individual countries can have lower interest rates and can abandon attempts at fine-tuning—although the feasible set of policies for smaller open economies will be much constrained unless the United States, Germany, and Japan abandon monetarism.

²⁰ As Knapp (1924) and Mosler (1995) argue, the public accepts fiat money primarily because it can be used to meet tax liabilities.

²¹ Again, it can be argued that transactions between the Fed and Treasury are mere internal accounting procedures. Modern arrangements ensure that there is no limit to the treasury’s ability to deficit spend by “selling” bonds to the Fed, which then supplies reserves to allow the Treasury to “spend.” The Fed will then be induced to sell some of its bonds to private markets to replace nonearning reserves with earning bonds—at a price determined by the Fed. If the central bank is targeting an overnight rate (such as the fed funds rate), then it will be forced to sell bonds to maintain the target rate; as Mosler argues, the fed funds rate would be driven toward zero if there were any “excessive” reserves—thus, open-market operations are required to maintain targeted overnight rates. As he argues, the quantity of bonds offered in such operations is “interest rate support,” and not a “financing” operation.

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