more and more private-sector investment opportunities become unprofitable, and lenders become more risk averse about making loans. Unlike the private sector, the government faces no interest-rate constraint on its spending programs, and Treasury debt carries essentially no rate of growth. This is particularly true during the most recent periods; however, long-term velocity growth and long-term real output growth have fluctuated within a much narrower range than either long-term money growth or inflation, and they frequently moved in directions that did not contribute to the movement in the inflation rate as shown in equation 2. Consequently, linkages between deficits and velocity growth and between deficits and long-term real output growth are probably much less important for inflation than linkages between deficits and money growth. The monetary link between deficits and inflation is also important, because long-term money growth is more directly under the control of policymakers than either velocity or long-term real growth. Even if persistent Treasury borrowing should raise velocity or reduce long-term real growth, the Federal Reserve System can undertake the necessary offsetting adjustments to maintain price stability. In this sense, inflation is ultimately the product of government policy. As indicated earlier, the System’s ability to conduct offsetting and anti-inflation monetary policy is best preserved when the System is using monetary aggregate targets instead of interest-rate targets. For this reason the Federal Reserve’s October 1979 monetary policy change is an important and necessary anti-inflation step, even in an era when Treasury borrowing to finance large and persistent federal deficits is placing upward pressure on interest rates.

Owen Humpage is an economist with the Federal Reserve Bank of Cleveland. The opinions stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

When the Reagan administration first took office, it forecast federal budget deficits of $45 billion for fiscal year (FY) 1982 and $23 billion for FY 1983, and projected a balanced budget by FY 1985. Fiscal year 1982, however, ended in September with a record $112 billion deficit; budget analysts now expect a deficit of approximately $60 billion to $80 billion in FY 1983. Moreover, the deficit has continued to remain above $100 billion through FY 1986 unless Congress takes steps to increase taxes or decrease expenditures. The federal government must finance these deficits by selling Treasury securities either to the Federal Reserve System or to the public.

The prospects for large federal budget deficits persist for several more years and have raised fears that the hard-fought gains recently won against inflation will come to naught and that the Federal Reserve will be forced to control inflation with more restrictive monetary policy. In the United States there appears to be a long-term association between persistent budget deficits and inflation. Since FY 1960, there has been only one year—1969—when the federal budget was not in deficit. The annual rate of inflation, as measured by the GNP implicit price deflator, rose from a 1.0 percent to 2.0 percent range in the early 1960s to approximately 9.0 percent in both FY 1980 and FY 1981. The relationship between deficits and inflation, however, is sufficiently weak to raise doubts about the claim that deficits cause inflation. Between FY 1975 and FY 1979, for example, the deficit narrowed by approximately $39 billion while inflation rose 3.5 percent.

Expanding this perspective and maintaining the emphasis on an appropriately long-time frame, the equation is consistent with the existence of inflation: inflation (πt) cannot exist without an equally persistent rise in the money supply (M) or a decline in the demand for money, evidenced by a rise in velocity (Vt) that outpaces the growth in the money stock.
Data from the Flow of Funds, Board of Governors

2. When reserves are lent and reloaned in a fractional-reserve banking system, the initial increase in reserves is incapable of supporting a much larger increase in the reserve banking system, the initial increase in reserves could be monetized by the Federal Reserve System. Unlike the indirect interest-rate link, however, the correlation between money creation and deficit financing produced by a direct link is forborne by the business cycle does not imply a causal link between deficits and money-stock growth. The key issue is whether the Federal Reserve, in response to budget deficits, would monetize government debt.

3. Although not unanimous in their findings, empirical studies indicate that increases in government debt reduce the long-term growth rate of the velocity of money (see equation 2). An increase in the velocity of money implies that individuals are holding money substitutes, wealth, and innovations in the payments mechanism, such as credit cards and electronic funds transfer. Persistent deficits could raise the velocity of money and thereby support a larger rate of GNP growth. Changes in velocity are associated with changes in interest rates, availability of money substitutes, wealth, and innovations in the payments mechanism, such as credit cards and electronic funds transfer. Persistent deficits could raise the velocity of money and thereby support a larger rate of GNP growth. Changes in velocity are associated with changes in interest rates, availability of money substitutes, wealth, and innovations in the payments mechanism, such as credit cards and electronic funds transfer. 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Deficits and Output

As suggested in equation 2, federal deficits reduce the nation's ability to supply goods and services, whereas lower money and velocity growth (a lower ratio of money to income) would cause the term growth of real output and not to short-term fluctuations in the business cycle. Business-cycle declines in the output gap are accompanied by changes in velocity, and money substitutes, wealth, and innovations in the payments mechanism, such as credit cards and electronic funds transfer. Persistent deficits could raise the velocity of money, as the Federal Reserve may attempt to accommodate federal-deficit financing during the 1960s and 1970s, but not during the 1950s. 2 A number of factors can explain this apparent shift during the early 1960s in the willingness of the Federal Reserve to accommodate the federal deficit. Between 1947 and 1960, the budget deficit had been significantly lower than in the years immediately preceding World War II. The Treasury, by leveraging the stock of bank reserves as the primary means of controlling money-market rates, was able to substantially put upward pressure on interest rates during this period, especially during the early 1950s. In contrast, the economic impact of the Great Depression and the early 1950s, therefore, interest rates targeted as a means of stabilizing prices for the Treasury, Fed- eral Reserve, and money institutions increased inflation expectations. Between deficit spending, monetary growth, and inflation.

The linkage between budget deficits and money creation also would exist if both the fiscal and monetary authori- ties conducted their policies to reduce savings in the business cycle. In the late 1960s and early 1970s, the government focused more on the overall policy goal of maintaining potential output instead of smoothing business-cycle fluctuations. A


5. If the government finances a $100 billion deficit by issuing one-year securities at the market interest rate, then the present value of the interest payments is 10 percent of the cost, the interest rate is 10 percent. Hence, the present value of the interest payments is $10 billion. However, the present value (PV) of paying the $100 billion in one year is $100 billion. The difference between $100 billion and $10 billion is $90 billion.

2. When reserves are lent and relented in a fractional reserve banking system, the reserve obligation to do so. The Federal Reserve System, but it seldom used this facility directly. The Treasury recently maintained a limited direct borrowing privilege of less than $5 billion with the Federal Reserve when needed to meet short-term obligations and to use its funds as net wealth, through future taxes, the current generation would have to pay. The outcome also depends on the real rate of interest and the expected rate of inflation. The Federal Reserve System is responsible for trying to accommodate the monetary policy decisions of the government. It manages the money supply in a way that is consistent with the overall economic goals of the country. The Federal Reserve System owns nearly 23 percent of the outstanding, public debt, including nearly 6th ed., London: Harper & Row, 1973.

2. As suggested in equation 2, federal deficits are accommodated by the increased supply of money, the increased demand for real assets, increased velocity, and increased spending for such entitlement programs. Although the March 1951 Accord did not have a change in interest rates, it achieved its goal of reducing the velocity of money through increased deficits.

3. When interest rates tend to rise, the Federal Reserve can use open market operations to buy government securities and thereby inject reserves into the banking system, offsetting the increase in velocity. This reduction in velocity reduces the demand for money and thereby reduces interest rates.


3. Data from the Flow of Funds, Board of Governors of the Federal Reserve System.

4. For deficits to raise velocity, assuming individuals' demands for financial assets, including money, and for nonfinancial assets. For example, if the Federal Reserve buys Treasury debt, it could supply more money to the economy, which would increase velocity. This increased velocity would increase the demand for real assets, such as houses and cars, which would increase GDP. However, if the Federal Reserve were to inject too much money into the economy, it could lead to inflation, which would reduce the purchasing power of consumers.

5. If the government finances a $1 billion deficit by selling Treasury securities, the money supply increases by $1 billion. If the Federal Reserve purchases these securities, the money supply increases by $1 billion. However, the present value of the $1 billion in future taxes would be less than $1 billion, and the government would be able to invest the $1 billion in its own ten-year Treasury bonds. Therefore, the effective cost to the government would be less than $1 billion.

6. Although a deficit tends to shift the burden of tax increases to future generations, it also provides benefits to current generations, such as lower interest rates and increased government spending. The long-term effects of deficits depend on the specific circumstances of each country and the policies implemented by the government.
more and more private-sector investment opportunities become unprofitable, and lenders become more and more cautious about making loans. Unlike the private sector, the government faces no interest-rate constraints on its spending programs, and Treasury debt carries essentially no default risk. When credit is scarce, the Treasury moves to the head of the credit queue, squeezing some private borrowing from the line, a phenomenon known as "crowding out." 

Most economists acknowledge that crowding out occurs, but disagree about its extent and time frame over which it occurs, and its importance for long-term real growth. Many believe that in the long run, crowding out by Treasury borrowing displaces a dollar of private investment. The large budget deficits of the early 1960s were appropri- ate only during economic downturns and that budget surpluses should be generated during economic recoveries so that the budget is balanced over the business cycle. Large deficits that persist over the cycle reduce the rate of private capital accumulation; consequently, the economy experiences a substitution of slow-growth public spending for more rapid-growth private spending. Other economists assert that deficits could result in a substitution of public spending for private spending and allow that deficits can influence real long-term growth and that because governments can control the money stock, deficits can influence real growth. Over the past 30 years, changes in the long-term rate of inflation appeared closely related to changes in the long-term money-growth rate (see table 1). When long-term money growth accelerated (or decelerated), inflation nearly always ac- celerated (or decelerated). Similar close relationships in the appropriate directions generally are not apparent when changes in the rate of inflation are compared with changes in either long-term velocity growth or long-term real-output growth. Changes in the long-term growth of veloc- ity and changes in the long-term growth of real output on occasion explain more of the change in the rate of inflation than changes in money-stock growth. This is particularly true during the most recent periods; however, long-term velocity growth and long-term real-output growth have fluctuated within a much narrower range than either long-term money growth or inflation, and they frequently moved in directions that did not contribute to the movement in the inflation rate as shown in equation 2. Consequently, linkages between deficits and velocity growth and between deficits and long-term real-output growth are probably much less important for inflation than linkages between deficits and money growth. The monetary link between deficits and inflation is also important, because long-term money growth is more directly under the control of policymakers than either velocity or long-term real growth. Even if persistent Treasury borrowing should raise velocity or reduce long-term real growth, the Federal Reserve System can under- take the necessary offsetting adjustments to maintain price stability. In this sense, inflation is ultimately the product of gov- ernment policy. As indicated earlier, the System's ability to conduct offsetting and anti-inflation monetary policy is best pre- served when the System is using monetary-aggregate targets instead of interest-rate targets. For this reason the Federal Re- serve's October 1979 monetary-policy change is an important and necessary anti-inflation policy change in an era when Treasury borrowing to finance large and persistent federal deficits is placing up- ward pressure on interest rates.

Owen Humpage is economist with the Federal Reserve Bank of Cleveland. The opinions stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

Do Deficits Cause Inflation?

by Owen F. Humpage

When the Reagan administration first took office, it forecast federal budget defi- cits of $45 billion for fiscal year (FY) 1982 and $60 billion for FY 1983, and projected a balanced budget by FY 1985. Fiscal year 1982, however, ended in September with a record $115 billion deficit; budget analysts now expect a deficit of approxi- mately $115 billion to $125 billion in FY 1983. Moreover, the deficit of FY 1983 will remain above $100 billion through FY 1985 unless Congress cuts expenditures or increases taxes. The federal government must finance these deficits by selling Treasury securities either to the Federal Reserve Sys- tem or to the public.

The prospects for large federal budget deficits in the near future have raised fears that the hard- fought gains recently won against inflation will be lost as the economic recovery gath- ers momentum. In the United States there appears to be a long-term association be- tween persistent budget deficits and infa- tion. Since FY 1960, there has been only one year, FY 1969, when the federal budget was not in deficit. The annual rate of inflation, as measured by the GNP implicit price deflator, has fluctuated from a 1.0 percent to 2.0 percent range in the early 1960s to approximately 9.0 percent in both FY 1980 and FY 1981. The rela- tionship between deficits and inflation, however, is sufficiently weak to raise doubts about the claim that deficits cause inflation. Between FY 1975 and FY 1979, for example, the deficit narrowed by approxi- mately $39 billion while the rate of infla- tion increased by 3.0 percentage points.

This Economic Commentary explores the role that channels through which defi- cits could cause inflation. Unless we can control the unique role money plays in the inflation

<table>
<thead>
<tr>
<th>Period</th>
<th>Rate%</th>
<th>Difference Rate%</th>
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<tbody>
<tr>
<td>1953:IIQ-1957:IQ</td>
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<td>1.5</td>
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<tr>
<td>1957:IQ-1960:IQ</td>
<td>1.9</td>
<td>0.6</td>
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<tr>
<td>1960:IVQ-1963:IQ</td>
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<td>0.2</td>
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<td>1963:IIQ-1967:IQ</td>
<td>5.2</td>
<td>3.2</td>
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<td>5.2</td>
<td>3.2</td>
</tr>
<tr>
<td>1970:IVQ-1973:IQ</td>
<td>5.0</td>
<td>3.0</td>
</tr>
<tr>
<td>1973:IIQ-1976:IQ</td>
<td>3.7</td>
<td>1.7</td>
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<tr>
<td>1976:IVQ-1979:IQ</td>
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Cycle. Large deficits that persist over the long term relative to changes in the long-term money-growth rate (see table 1). When long-term money growth accelerated (or decelerated), inflation nearly always accelerated (or decelerated). Similar close relationships in the appropriate directions generally are not apparent when changes in the rate of inflation are compared with changes in either long-term velocity growth or long-term real-output growth. Changes in the long-term growth of velocity and changes in the long-term growth of real output on occasion explain more of the change in the rate of inflation than changes in money-stock growth. This is particularly true during the most recent periods; however, long-term velocity growth and long-term real-output growth have fluctuated within a much narrower range than either long-term money-growth or inflation, and they frequently moved in directions that did not contribute to the movement in the inflation rate as shown in equation 2. Consequently, linkages between deficits and velocity growth and between deficits and long-term real-output growth are probably much less important for inflation than linkages between deficits and money growth.

The monetary link between deficits and inflation is also important, because long-term money growth is more directly under the control of policymakers than either velocity or long-term real growth. Even if persistent Treasury borrowing should raise velocity or reduce long-term real growth, the Federal Reserve System can undertake the necessary offsetting adjustments to maintain price stability. In this sense, inflation is ultimately the product of government policy. As indicated earlier, the System's ability to conduct offsetting and anti-inflation monetary policy is best preserved when the System is using monetary-aggregate targets instead of interest-rate targets. For this reason the Federal Reserve's October 1979 monetary-policy change is an important and necessary anti-inflation device and not in any way a substitute for Treasury borrowing to finance large and persistent federal deficits is placing upward pressure on interest rates.

Owen Humpage is on economic with the Federal Reserve Bank of Cleveland. The opinions stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System. When the Reagan administration first took office, it forecasted federal budget deficits of $45 billion for fiscal year (FY) 1982 and $57 billion for FY 1983, and projected a balanced budget by FY 1985. Fiscal year 1982, however, ended in September with a receipts of $11 billion above budget; budget analysts now expect a deficit of approximately $10 billion to $15 billion in FY 1983. Moreover, the deficit not only would remain above $10 billion through FY 1984, but could increase even further as the Administration increases taxes. The federal government must finance these deficits by selling Treasury securities either to the Federal Reserve System or to the public. Fisher's equation of exchange provides a useful framework for analyzing inflation. It is tautologically true that:

\[ MV = PQ \]

where \( M \) is the money stock, \( V \) is the velocity of money, \( P \) is the price level, and \( Q \) is the quantity of goods and services. When the money supply increases by \( m \) percent and neither the price level nor the quantity of goods and services change, the equation of exchange is consistent with the earlier definitions of the equation in percentage rates of change. The real equation is useful in that the overall price level is a function of the quantity of goods and services and the nominal equation of exchange. It is tautologically true that:

\[ \text{Equation of Exchange} \]

The money supply (\( M \), measured in any form) affects the velocity of money (\( V \)), which is defined as the average number of times the money stock changes hands per unit of time. Fisher's equation of exchange provides a useful framework for analyzing inflation. It is tautologically true that:

\[ MV = PQ \]

where \( M \) is the money stock, \( V \) is the velocity of money, \( P \) is the price level, and \( Q \) is the quantity of goods and services. When the money supply increases by \( m \) percent and neither the price level nor the quantity of goods and services change, the equation of exchange is consistent with the earlier definitions of the equation in percentage rates of change. The real equation is useful in that the overall price level is a function of the quantity of goods and services and the nominal equation of exchange.