

# Deficit-Financed Tax Cuts and Interest Rates

BY SYLVAIN LEDUC

**P**roposals to lower taxes often meet with opposition in Congress. One argument is that lowering taxes without an equivalent fall in government spending may lead to future budget deficits, which will translate into higher long-term interest rates and a lower level of income. In this article, Sylvain Leduc examines the theoretical arguments under which budget deficits lead to higher interest rates. He also surveys empirical studies that used data on expected budget deficits to document the possibility that increases in future budget deficits are associated with higher real long-term interest rates.

In 2001 and 2003, the Bush administration proposed a significant reduction in income taxes, which was later adopted by Congress. In general, reducing income taxes could be beneficial for the economy, since it raises the incentive to work and leads to a higher level of income. Yet, the proposal to lower taxes was met with opposition. One popular argument against lowering taxes is that without an equivalent

fall in government spending, a drop in taxes may lead to future budget deficits, which will translate into higher long-term interest rates and a lower level of income.

Recently, the debate over budget deficits' impact on interest rates has created a lot of turmoil in the financial press. For instance, an editorial in the *Wall Street Journal* stated that "the notion that deficits cause interest rates to rise is a fiction argued by Robert Rubin, President Clinton's Treasury secretary. There wasn't any empirical evidence to support this argument when Mr. Rubin trotted it out, and there's still isn't." However, in his testimony to Congress in February 2003, Alan Greenspan, Chairman of the Federal Reserve Board, stated: "There is no question that if deficits go

up, contrary to what some have said, it does affect long-term interest rates; it does have a negative impact on the economy."

Let's examine the theoretical arguments under which budget deficits lead to higher interest rates and survey empirical studies that used data on expected budget deficits to document the possibility that increases in future budget deficits are associated with higher real long-term interest rates.

## THE DEBATE IS NOT NEW, AS PRESIDENT REAGAN WILL TELL YOU

Until recently, budget deficits were closely associated with either economic downturns or military expenses during periods of war (Figure 1).<sup>1</sup> For instance, World War I brought about a cumulated budget deficit that reached 17 percent of GDP in 1919, but the budget was brought back into surpluses in the 1920s. Similarly, because of the combined effects of the Great Depression in the 1930s and World War II, the federal government posted deficits from 1931 to 1946. The war effort pushed the budget deficit to a level as high as 30 percent of GDP in 1943. The deficit also rose during the Korean and Vietnam wars.

However, the close relationship between budget deficits and periods of war or recessions came to an abrupt end at the beginning of the 1980s. Indeed, the federal budget was



Sylvain Leduc is a senior economist in the Research Department of the Philadelphia Fed.

<sup>1</sup> See the *Business Review* article by Lee Ohanian on the consequences of financing wars via increases in borrowing or taxes.

in deficit throughout that decade and most of the roaring 1990s, even though this period coincided with the longest peacetime expansion in U.S. history. The break in the relationship occurred in President Reagan's first term in office. In 1981, the Republican Party won the White House on a platform to cut marginal income tax rates and decrease nondefense government spending. The underlying goal was to diminish the economic distortion associated with income taxation. By lowering after-tax income, high marginal income tax rates might decrease the incentive to work and hamper economic performance. (This is often referred to as supply-side economics, since it emphasizes taxation's effect on the supply of goods in the economy. In comparison, Keynesianism emphasizes taxation's impact on the demand for goods in the economy.)

In Reagan's first year in office, Congress adopted his proposal to lower marginal tax rates. However, lower revenues due to the tax cut and the recession of 1981-82, combined

with the increase in defense spending, contributed to the large budget deficits throughout his first term. The budget deficit reached 4 percent of GDP in 1982 and 6 percent of GDP in 1983.

**According to the standard theory, the way a government decides to finance a given level of expenditure has important repercussions for the economy.**

We have to go back to 1934, in the midst of the Great Depression, to observe a level of peacetime budget deficits as high as those in the early 1980s.

Then, as now, a debate raged over the consequences of the deficits. For instance, the Council of Economic

Advisers under the chairmanships of Murray Weidenbaum and Martin Feldstein warned of the potential negative impact of large (prospective) budget deficits on the economy.<sup>2</sup> The Council of Economic Advisers and the OMB would, in the end, convince President Reagan to tackle the deficit issue by raising taxes. But the U.S. would have to wait until 1998 before the red ink had all been spilled and the government's finances returned briefly to the black.

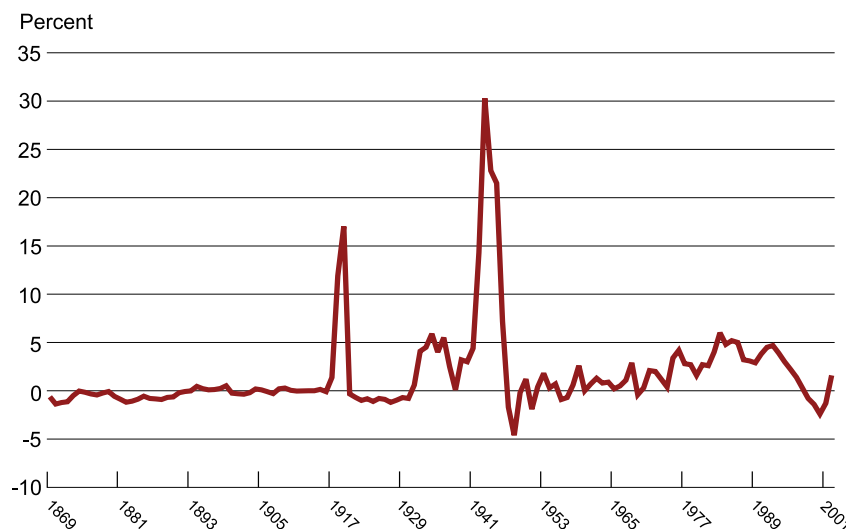
### DEFICITS CROWD OUT INVESTMENT

According to the standard theory, the way a government decides to finance a given level of expenditure has important repercussions for the economy. In particular, suppose the government decides to lower income taxes and starts financing its spending by increasing the amount of funds it borrows from the public. Consumers, according to this view, will save only part of the rise in their after-tax income and spend the remainder on goods. Since the fall in government savings is not fully matched by a rise in private savings (since consumers spend part of their tax cut), total savings in the economy must fall. For economies without access to (or that do not make use of) foreign sources of funds, the level of national savings — which is the difference between output and consumption — has important implications for the future level of output.

In today's world of highly developed financial markets, countries often borrow and lend to each other. For instance, a country may decide to

**FIGURE 1**

### Federal Budget Deficit (as a percent of GDP)



<sup>2</sup> In the 1983 *Economic Report of the President*, the Council notes that "a succession of large budget deficits is likely to reduce substantially the rate of capital formation," since "high budget deficits would cause interest rates to rise."

consume more than it produces by importing relatively more goods from other countries than it exports and paying for them by borrowing in financial markets. In economic terminology, the current account would be in deficit, while the capital account would be in surplus.<sup>3</sup> However, if an economy does not have access to financial markets, it will not be able to finance a trade deficit — that is, import more than it exports — by borrowing from other countries. The only way to pay for imports would be with revenues from exports. In other words, net exports would have to be zero.

To understand the implications of having zero net exports, we need to make a small detour to the world of accounting. The national income and product accounts (NIPA) divide the amount of output produced in the economy into four broad categories: private consumption, government consumption, investment, and net exports. In other words, the output produced in any given period can be used by the private sector or the government, invested, or traded with other countries. If the amount of goods produced in the economy is larger than the sum of investment and consumption by the private sector and the government, net exports will be positive because the country would export the output left over after accounting for consumption and investment.

Because the difference between output and consumption (by both the private sector and the government) is defined as national savings, the national accounts tell us that national savings must equal national

investment, whenever net exports are zero. The important consequence for a country without access to foreign sources of funds (that is, net exports are zero) is that if national savings fall following a tax cut, investment must also necessarily fall. This is achieved through an increase in long-term interest rates that works to choke off investment and to bring it in line with the lower level of national savings. And the lower level of investment will be reflected in lower levels of real GDP in the future.

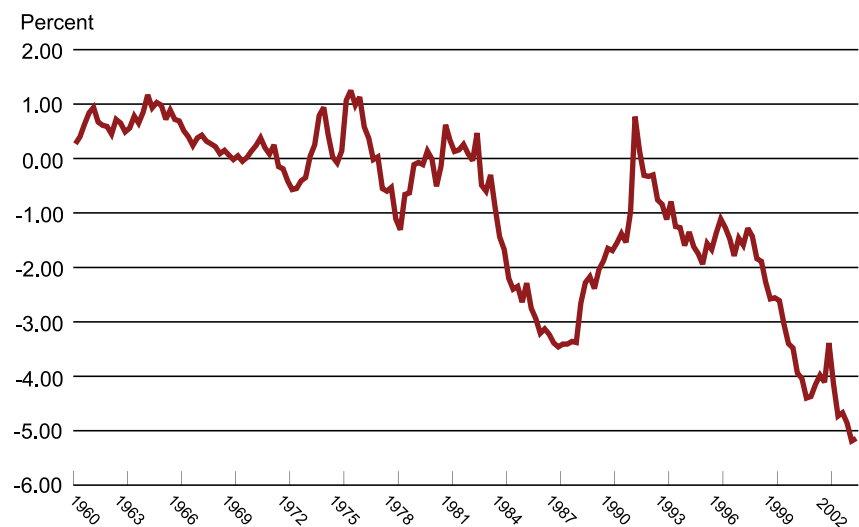
The outcome would be different for an economy with access to foreign sources of funds. In this case, an increase in the amount of funds borrowed from foreigners would make up for the fall in the level of national savings. In other words, a country could consume and invest more than it produces by importing relatively more goods from abroad than it exports (that is, the current account would be in deficit) and finance it by borrowing funds from foreigners (that is, the capital account would be in surplus). De-

pending on how important the country is in world financial markets, the demand for foreign funds may still push interest rates upward. However, investment would not have to fall as a result. In an economy with access to foreign sources of funds, domestic investment does not need to equal national savings. Because the country can borrow from foreigners, domestic investment can be financed out of national savings or foreign sources of funds and via a current account deficit.

In fact, at the same time that the U.S. saw its budget deficit mushroom in the 1980s, it also saw a growing current account deficit (Figure 2). However, even in the face of a growing current account deficit, Martin Feldstein, chairman of the Council of Economic Advisers at the time and a proponent of the standard theory, continued to argue that the fall in investment would be very substantial. His argument was based on a finding that he and Charles Horioka uncovered in the early 1980s. They found that even though capital flows increased

**FIGURE 2**

**Current Account (as a percent of GDP)**



<sup>3</sup> The current account is defined as the sum of the trade balance — that is, exports minus imports — and investment earnings abroad. Typically, the latter is a very small fraction of the current account. Therefore, the current account is approximately equal to the trade balance.

substantially across countries, the fact remained that domestic investment was closely linked to domestic saving. Indeed, Figure 3 shows that movements in domestic investment closely mimic those in national savings, the difference between the two being accounted for by the current account.

In other words, countries did not take advantage of foreign sources of funds, since net exports and current account deficits/surpluses remain relatively small. Therefore, a fall in national savings stemming from a rise in the budget deficit would very likely be followed by a fall in investment and capital formation. In a nutshell, the economy would pay for the fall in taxes today with a lower level of output in the future.

### WHAT COMES DOWN MUST GO UP!

The main tenet of the standard theory is that national savings falls following a shift in government finance away from taxes toward borrowing. The reason is that consumers will save only part of their tax cut and spend what is left. But why would consumers save only part of the tax cut? Why not save it all? After all, the government will have to repay the money it borrowed some day, and it will have to raise taxes to do so. A forward-looking consumer will anticipate this necessity and accurately predict that his level of taxation will rise at some later date. As a result, he may very well decide to save *all* his current tax cut. If this occurs, the fall in government savings would be matched by an equivalent increase in private savings, leaving national savings constant. Since national savings does not change, interest rates would not have to rise and thereby choke off investment. In the case of an open economy—that is, one that engages in international trade and financial transactions—the amount of

funds borrowed from foreigners would not have to increase to keep the same level of investment constant. Since the level of borrowing from abroad remains the same, a rise in the budget deficit would also have no impact on the current account.

This approach to budget deficits was first formulated by the 19th century English economist David Ricardo, but it was rediscovered and formalized by Robert Barro in a very influential article published in 1974. Economists refer to this view as *Ricardian equivalence*. This theory argues that the way the government finances a given level of expenditure (such as a national army or a public road system) is irrelevant. Taxing or borrowing will lead to the same economic outcome because people are forward looking.

One important assumption buried underneath this elegant theory is the way the government taxes individuals. The theory assumes that each individual in the economy must pay the same amount in taxes irrespective of his income or of what he consumes.

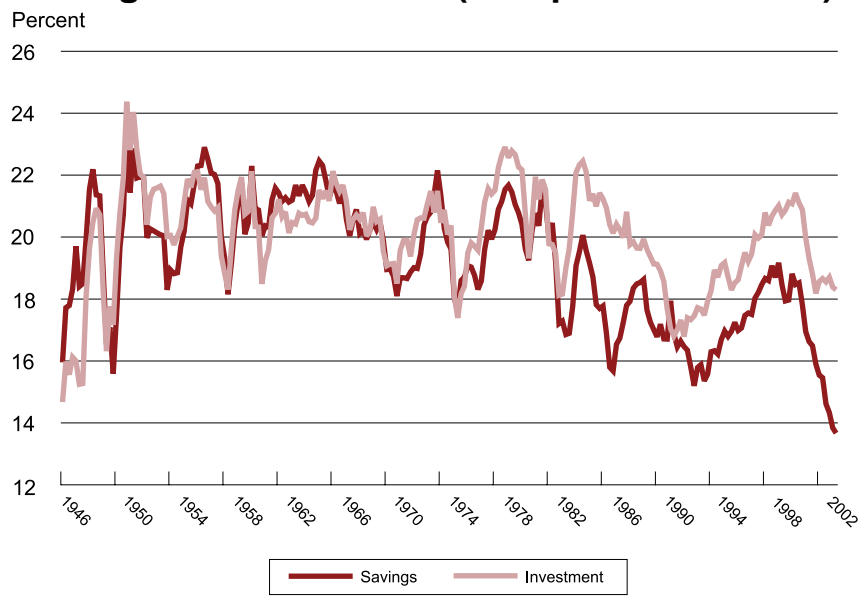
In other words, taxes are paid in a lump sum. Because taxes are not tied to the level of labor or capital income that an individual earns or to how much he consumes, lump sum taxes do not distort incentives to work, invest, and consume.

In reality, to raise revenues, governments most often resort to taxes on labor and capital income or to taxes on goods and services. One could then be tempted to disregard the Ricardian equivalence theory as a cute abstraction that is empirically flawed and, therefore, not a serious guide for policymaking. Consequently, an increase in the budget deficit would most likely lead to a fall in national savings and to an increase in interest rates.

However, according to Nobel laureate Milton Friedman, theories should not be judged on the plausibility of their assumptions, but rather on the accuracy of their predictions. Is an increase in budget deficits associated with an increase in real long-term, interest rates, as the standard theory predicts? Or is the Ricardian equiva-

**FIGURE 3**

### Savings and Investment (as a percent of GDP)



lence theory, in which there is no link between budget deficits and real long-term interest rates, a better representation of the world?

### CURRENT BUDGET DEFICITS AND INTEREST RATES

The Ricardian equivalence theory argues that there should be no positive relationship between budget deficits and real long-term interest rates, i.e., interest rates adjusted for expected inflation.<sup>4</sup> Proponents of this view often point out that there is indeed no clear relationship between these variables in the data (Figure 4). There are times, such as the early 1980s, when the budget deficit and the real long-term interest rate move in the same direction: an increase in the budget deficit as a percent of GDP is associated with a rise in the real long-term interest rate. However, at other times, an increase in the budget deficit as a percent of GDP is associated with a *fall* in the real long-term interest rate. For instance, since the beginning of 2000, the federal budget has gone from a surplus of 2.3 percent of GDP to a deficit of the same magnitude in the first quarter of 2003. Yet, real long-term interest rates have fallen steadily over the same period.

Note also that because the level of national savings is unaffected by a rise in budget deficits under the Ricardian equivalence theory, a change in budget deficits is not predicted to lead to a change in the amount of funds borrowed from abroad, and, therefore, the current account. In the early 1980s, opponents

of this theory often pointed out that this prediction was contradicted by the U.S. experience: the rise in budget deficits at the time was accompanied by a substantial increase in the current account deficit. Indeed, the current account deficit went from being ap-

Although they moved in opposite directions in the early 1980s, the budget deficit and the current account tended to be positively correlated between the mid-1980s and the end of the 1990s, before they once again started to drift apart in 2000 (Figure 5).

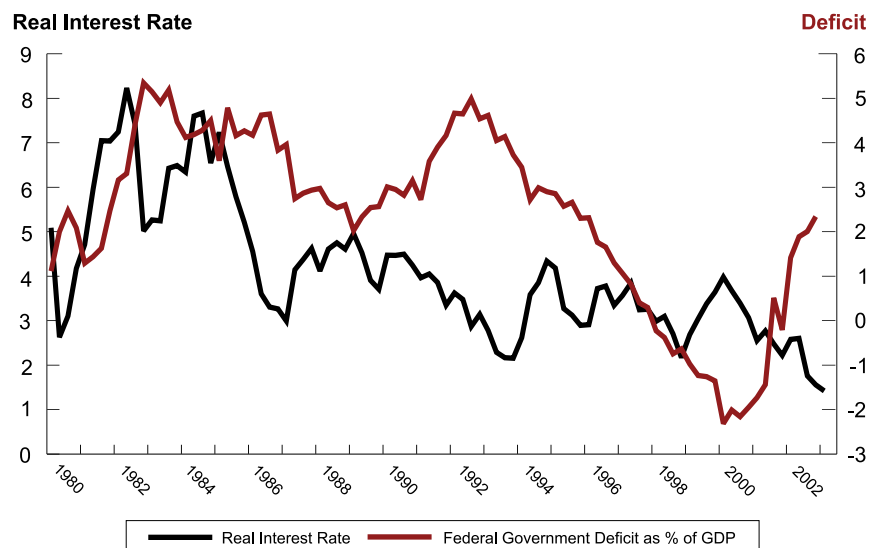
**The Ricardian equivalence theory argues that there should be no positive relationship between budget deficits and real long-term interest rates, i.e., interest rates adjusted for expected inflation.**

proximately balanced at the start of the 1980s to registering a deficit of about 3.5 percent of GDP by 1987. Yet, proponents of the Ricardian equivalence theory would point out that over a longer period of time, the relationship between the budget deficit and the current account is not that clear.

It therefore seems that, as predicted by the Ricardian equivalence theory, there is no clear relationship between current budget deficits, on the one hand, and interest rates (or the current account), on the other. However, interest rates are affected not only by current budget deficits but also

**FIGURE 4**

### Real Long-Term Interest Rate vs. Federal Government Deficit (as a percent of GDP)



<sup>4</sup> If we assume that the economy has access to foreign sources of funds, Ricardian equivalence also implies there should be no relationship between the current account and real long-term interest rates. Proponents of this theory often point out that there is no clear relationship between these two variables over long periods.

by prospective ones. Accounting for movements in prospective budget deficits turns out to be important for the empirical relationship between budget deficits and interest rates.

### BUT THE FUTURE MATTERS

We have seen there is no clear relationship between the current budget deficit and the real long-term interest rate. However, what matters for real long-term interest rates is not so much the current budget deficit, but what the budget deficit is expected to be in the future. A higher expected deficit implies that the government's borrowing needs will be higher in the future. The standard theory would then predict a higher (short-term) interest rate in the future. But higher future short-term interest rates must necessarily raise long-term interest rates today.

To see this, suppose that instead of rising, long-term interest rates stayed constant. An investor would then be better off holding a sequence of

short-term bonds paying the short-term interest rate in each period. Under this scenario, investors currently holding long-term bonds would be better off selling these assets and buying a sequence of short-term bonds instead. But this process would increase the supply of long-term bonds in the mar-

**What matters for real long-term interest rates is not so much the current budget deficit, but what the budget deficit is expected to be in the future.**

ket, causing their price to fall, and thus drive current long-term interest rates higher. This process would continue until, at the margin, the return to holding a long-term bond was equal

to the return from holding a sequence of short-term bonds, according to the *expectations theory of the term structure of interest rates*.<sup>5</sup>

So, according to the standard theory, higher expected budget deficits lead to higher real long-term interest rates. Is this theory supported by the data?

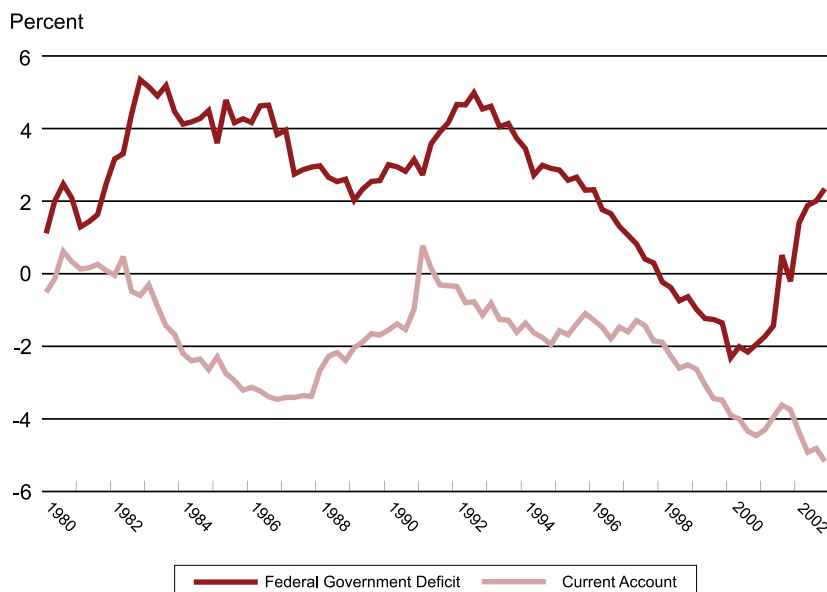
### PROSPECTIVE BUDGET DEFICITS AND INTEREST RATES

Although formal studies testing the impact of *current* budget deficits on interest rates found mixed results (see the article by John Seater), there seems to be a positive relationship between expected budget deficits and interest rates. Indeed, previous studies have highlighted the fact that prospective budget deficits and interest rates tend to move together.

Paul Wachtel and John Young conducted the first study examining the impact of prospective budget deficits on interest rates. They used the federal budget forecasts (for up to two years ahead) from the Office of Management and Budget (OMB) and the Congressional Budget Office (CBO), over the period 1979 to 1986. To capture the effect of an unanticipated movement in the prospective deficit (what economists call a shock), they used revisions in the OMB's and CBO's budget forecasts of current fiscal years. If large future budget deficits lead to higher interest rates, unanticipated announcements of such deficits should lead financial markets to revise interest rates up. Wachtel and Young found that a \$1 billion increase in the CBO's forecast of the federal budget deficit for the current fiscal year led to

**FIGURE 5**

### Current Account and Budget Deficits (as a percent of GDP)



<sup>5</sup> The term structure of interest rates refers to the relationship among interest rates on bonds with different terms of maturity.

an average 0.30-basis-point increase in interest rates.<sup>6</sup> Similarly, a \$1 billion revision in the OMB's forecast of budget deficits pushes interest rates up 0.18 basis point, on average. This impact is significant. For instance, in August 2003, the CBO revised its forecast of budget deficits for the next 10 fiscal years that it initially made in March 2003. In the spring of 2003, the CBO forecast a surplus of \$96 billion in 2010, which was revised to a deficit of \$145 billion in August 2003. Other things being equal, Wachtel and Young's estimate would imply a rise of 72 basis points in interest rates.

Recently, Thomas Laubach revisited the subject. Just as Wachtel and Young did, Laubach used forecasts of federal budget deficits from the OMB and the CBO from 1976 to 2003. One important difference between these two studies is that Laubach used forecasts with much longer horizons. Instead of studying forecasts of budget deficits two years in the future, he concentrated on the impact of budget deficits five years in the future.

There are good theoretical reasons for using longer-term forecasts. The state of the business cycle affects budget deficits. In recessions, tax revenues decline because fewer people are working. The fall in government revenues automatically raises budget deficits. Moreover, the state of the business cycle also affects interest rates: they rise during expansions and fall during recessions. Therefore, a recession would tend to lower interest rates at the same time that it raised the budget deficit. Similarly, interest rates would rise and the budget deficit would fall during an expansion. Interest rates and budget deficits should therefore be *negatively* correlated along the business cycle.

<sup>6</sup> A basis point is one hundredth of a percentage point.


Yet, since the goal is to isolate the impact of fiscal policy on interest rates — such as a decision by Congress to lower taxes, thus raising budget deficits — we need to remove the implicit negative correlation between budget deficits and interest rates that occurs over the business cycle. Using longer-term forecasts is useful in accomplishing this goal, since the impact of the business cycle is over after approximately two to three years. Indeed, Laubach found that using long-term forecasts is important. For instance, he finds that a 1-percentage-point increase in the projected deficit as a fraction of GDP is associated with a 25-basis-point rise in long-term interest rates, which is roughly twice as large as the effect uncovered by Wachtel and Young.<sup>7,8</sup>

<sup>7</sup> Note that Wachtel and Young looked at the effect of a \$1 billion change in the forecast of the budget deficit, whereas Laubach studied the impact of a 1-percentage-point increase in the forecast of the deficit as a percent of GDP. However, in Wachtel and Young, a \$1 billion change in the budget deficit was roughly equal to 0.025 percent of GDP. Thus, their study would imply that a 1-percentage-point increase in the projected deficit to GDP ratio would lead interest rates to rise 12 basis points.

<sup>8</sup> The reader should keep in mind an important caveat to these analyses. Even though prospective budget deficits and interest rates are positively correlated, it does not necessarily imply that an increase in prospective budget deficits will cause interest rates to rise. The reason is that both may be rising because of movements in some other variables that remain unaccounted for in the empirical analysis. Prospective budget deficits are more likely to cause interest rates to rise to the extent that the impact of these other variables on budget deficits and interest rates is taken into account in the empirical work.

## CONCLUSION

Are budget deficits associated with an increase in long-term interest rates? Recent empirical work shows that they are, once we account for the impact of expected future budget deficits on current long-term interest rates. Prospective budget deficits are important because by lowering the expected level of future national savings, they put upward pressure on expected short-term interest rates. According to the expectations theory of the term structure of interest rates, an increase in expected short-term interest rates raises current long-term interest rates, which can dampen investment and lead to lower levels of real GDP in the future.

The fact that a fall in national savings is associated with a rise in interest rates is consistent with the findings that, notwithstanding the increasing globalization of financial markets, national economies remain less integrated than is usually imagined. Because domestic investment is still mostly financed out of national savings, an increase in future budget deficits that lowers expected future national savings is linked to an increase in interest rates that works to lower domestic investment and reduce the future level of output. 



## REFERENCES

Aiyagari, Rao S. "How Should Taxes Be Set?" Federal Reserve Bank of Minneapolis *Quarterly Review*, 13, 1989, pp. 22-32.

Alesina, Alberto, and Guido Tabellini. "A Positive Theory of Fiscal Deficits and Government Debt," *Review of Economic Studies*, 57, 1990, pp. 403-14.

Barro, Robert J. "Are Government Bonds Net Wealth?" *Journal of Political Economy*, 82, 1974, pp. 1095-1117.

Barro, Robert J. "On the Determination of the Public Debt," *Journal of Political Economy*, 87, 1979, pp. 940-71.

Council of Economic Advisers. *The Economic Report of the President* (1983).

Feldstein, Martin, and Charles Horioka. "Domestic Savings and International Capital Flows," *Economic Journal*, 90, 1980, pp. 314-29.

Friedman, Milton. "What Every American Wants," *Wall Street Journal*, January 15, 2003.

Laubach, Thomas. "New Evidence on the Interest Rate Effects of Budget Deficits and Debt," Board of Governors of the Federal Reserve System Working Paper 2003-12.

Ohanian, Lee E. "How Capital Taxes Harm Economic Growth: Britain Versus the United States," Federal Reserve Bank of Philadelphia *Business Review* (July/August 1997), pp. 17-27.

Persson, Torsten, and Lars E.O. Svensson. "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences," *Quarterly Journal of Economics*, 104, 1989, pp. 365-74.

Roberts, Paul C. "Mr. Feldstein's Fiscal Folly," *Wall Street Journal*, June 1, 1983.

Seater, John J. "Ricardian Equivalence," *Journal of Economic Literature*, 31, 1993, pp. 142-90.

Wachtel, Paul, and John Young. "Deficit Announcements and Interest Rates," *American Economic Review*, 77, 1987, pp. 1007-12.