

What Do Budget Deficits Do?

*Laurence Ball
N. Gregory Mankiw*

No issue in economic policy has generated more debate over the past decade than the effects of government budget deficits. Politicians of various ideologies argue that deficit reduction is critical to the future of the United States and other major economies. Although the economics profession is more divided over the issue, many economists share the view that deficits are harmful, and perhaps even disastrous.

When economists and policymakers decry deficits, they cite diverse reasons. Thus, despite almost unanimous concern over deficits, there is considerable controversy about what effects deficits have on the economy. The goal of this paper is to clarify these effects. Do budget deficits reduce economic growth? Threaten to create a financial crisis? Do deficits create winners as well as losers? If so, who are they? How large are the effects of deficits? Are deficits merely a chronic nuisance, or do they threaten us with economic decay and, to use Benjamin Friedman's (1988) ominous language, an upcoming "day of reckoning?"

To answer these questions, we proceed in several steps. The first section presents a positive analysis of the effects of budget deficits on aggregate economic variables such as GDP, exchange rates, and real wages. The analysis follows the conventional wisdom as captured, for example, in most undergraduate textbooks. In our view, the conventional wisdom in this area is mostly on the right track.

After describing the qualitative effects of deficits, we take a stab in the second section at quantifying the effects of recent deficits in the United States. As usual in economics, theory is too stylized to give precise estimates of the sizes of the effects. But some simple calculations shed light on the orders of magnitude involved.

The third section turns from positive analysis to a consideration of deficits and economic well-being. Our theme here is that deficits cause redistributions: some people lose from deficits, but others gain. It is possible to justify the common view that deficits are undesirable over all, but doing so is not as easy as one might think.

The fourth section turns from the question of what deficits currently do to what they *might* do in the future. We focus on the possibility that continued high deficits in a country will trigger a “hard landing” in which the demand for domestic assets collapses. Both the likelihood of such an event and its effects are highly uncertain. But the risk of a hard landing may be the most compelling reason for reducing budget deficits.

Budget deficits and the economy

Suppose two countries are identical and initially both have balanced budgets. Suddenly, for no good reason, one country starts running a budget deficit, either by raising government spending or by cutting taxes, while the other country keeps its budget balanced. How will the evolution of these two economies differ? In particular, how will budget deficits affect major economic variables, such as GDP, investment, net exports, wages, interest rates, and exchange rates?

The immediate effects of budget deficits

Budget deficits have many effects. But they all follow from a single initial effect: deficits reduce national saving. National saving is the sum of private saving (the after-tax income that households save rather than consume) and public saving (the tax revenue that

the government saves rather than spends). When the government runs a budget deficit, public saving is negative, which reduces national saving below private saving.

The effect of a budget deficit on national saving is most likely less than one-for-one, for a decrease in public saving produces a partially-offsetting increase in private saving. For example, consider a \$1 tax cut. This tax cut reduces public saving by \$1, but it also raises households' after-tax income by \$1. It is likely that households spend part of this windfall but save part as well. This implies that national saving falls, but by less than the fall in public saving.¹

How does lower national saving affect the economy? The answer can be seen most easily by considering some simple (and irrefutable) accounting identities. Letting Y denote gross domestic product, T taxes, C consumption, and G government purchases, then private saving is $Y - T - C$, and public saving is $T - G$. Adding these yields national saving, S :

$$S = Y - C - G.$$

National saving is current income not used immediately to finance consumption by households or purchases by the government.

The second crucial accounting identity is the one that divides GDP into four types of spending:

$$Y = C + I + G + NX.$$

Output Y is the sum of consumption C , investment I , government purchases G , and net exports NX . Substituting this expression for Y into the previous equation for national saving yields

$$S = I + NX.$$

This simple equation sheds considerable light on the effects of budget deficits. It says that national saving equals the sum of investment and net exports. When budget deficits reduce national saving, they must reduce investment, reduce net exports, or both.

The total fall in investment and net exports must exactly match the fall in national saving.

To the extent that budget deficits increase the trade deficit (that is, reduce net exports), another effect follows immediately: budget deficits create a flow of assets abroad. This fact follows from the equality of the current account and the capital account. When a country imports more than it exports, it does not receive these extra goods and services for free; instead, it gives up assets in return. Initially, these assets may be the local currency, but foreigners quickly use this money to buy corporate or government bonds, equity, or real estate. In any case, when a budget deficit turns a country into a net importer of goods and services, the country also becomes a net exporter of assets.

At first, some of these conclusions may appear mysterious. Business firms choose the economy's level of investment, and domestic and foreign consumers choose net exports. These decisions may seem independent of the political decisions that determine the budget deficit. If the government decides to run a deficit, what forces induce firms to invest less and foreigners to buy fewer domestic products?

The answer is that these changes are brought about by interest rates and exchange rates. Interest rates are determined in the market for loans, where savers lend money to households and firms who desire funds to invest. A decline in national saving reduces the supply of loans available to private borrowers, which pushes up the interest rate (the price of a loan). Faced with higher interest rates, households and firms choose to reduce investment.

Higher interest rates also affect the flow of capital across national boundaries. When domestic assets pay higher returns, they are more attractive to investors both at home and abroad. The increased demand for domestic assets affects the market for foreign currency: if a foreigner wants to buy a domestic bond, he must first acquire the domestic currency. Thus, a rise in interest rates increases the demand for the domestic currency in the market for foreign exchange, causing the currency to appreciate.

The appreciation of the currency, in turn, affects trade in goods and services. With a stronger currency, domestic goods are more expensive for foreigners, and foreign goods are cheaper for domestic residents. Exports fall, imports rise, and the trade balance moves toward deficit.²

To sum up: government budget deficits reduce national saving, reduce investment, reduce net exports, and create a corresponding flow of assets overseas. These effects occur because deficits also raise interest rates and the value of the currency in the market for foreign exchange.

Budget deficits in the United States

So far, our discussion of budget deficits has been theoretical. Do the effects we have discussed occur in actual experience? There is a large empirical literature that looks for these effects. Unfortunately, this work has neither refuted the theories we have sketched nor convinced skeptics of their validity. The main obstacle to convincing empirical work is the identification problem. Countries do not run fiscal policies as controlled experiments; instead, policies change over time in response to changing economic circumstances. It is difficult to sort out the effects of budget deficits from their causes.

Nonetheless, it is useful to examine the U.S. experience over the past dozen years. Table 1 provides some summary statistics. While these data do not prove anything definitively, they show that the U.S. experience can be explained by conventional theories. The figures also offer a sense of the magnitudes involved.

As the top line of Table 1 shows, beginning in the early 1980s, the U.S. government switched from a policy of (inflation-adjusted) budget surpluses to budget deficits. Public saving fell by 2.4 percent of GDP. Rather than rising as one might expect, private saving rates fell slightly, suggesting that the increased impatience exhibited in fiscal policy also infected the private sector. National saving fell by about 2.9 percentage points.

Table 1
The U.S. Experience

	Averages as a percent of GDP		
	1960-81	1982-94	Change
Public saving	0.8	-1.6	-2.4
Private saving	16.1	15.7	-0.4
National saving	16.9	14.0	-2.9
Domestic investment	16.5	15.7	-0.8
Net exports	0.3	-1.7	-2.0

Note: All variables are gross nominal magnitudes as a percentage of nominal GDP. Public and private saving have been adjusted for the effects of inflation: only the real interest on the national debt is counted as expenditure by the government and income to the private sector. Net exports here are measured as national saving less domestic investment; it thus includes the net income from domestically owned factors of production used abroad.

Source: U.S. Department of Commerce and authors' calculations.

So far, this fall in national saving has been associated with a fall in domestic investment of only .8 percentage point. As a result, the U.S. trade balance went from a small surplus to a large and persistent deficit, a fall of about 2 percent of GDP. These trade deficits have, as is necessary, been financed by the sale of domestic assets. In 1981, the U.S. stock of net foreign assets was about 12.3 percent of GDP; in 1993, it was *negative* 8.8 percent. The world's largest economy went from being a creditor in world financial markets to being a debtor.

Long-run effects of deficits: output and wealth

The effects described so far begin as soon as the government begins to run a budget deficit. Suppose, as is often the case, that the government runs deficits for a sustained period, building up a stock of debt. In this case, the accumulated effects of the deficits alter the economy's output and wealth.

In the long run, an economy's output is determined by its productive capacity, which, in turn, is partly determined by its stock of capital. When deficits reduce investment, the capital stock grows more slowly than it otherwise would. Over a year or two, this

crowding out of investment has a negligible effect on the capital stock. But if deficits continue for a decade or more, they can substantially reduce the economy's capacity to produce goods and services.

The flow of assets overseas has similar effects. When foreigners increase their ownership of domestic bonds, real estate, or equity, more of the income from production flows overseas in the form of interest, rent, and profit. National income—the value of production that accrues to residents of a nation—falls when foreigners receive more of the return on domestic assets.

Recall that budget deficits, by reducing national saving, must reduce either investment or net exports. As a result, they must lead to some combination of a smaller capital stock and greater foreign ownership of domestic assets. Although there is controversy about which of these effects is larger, this issue is not crucial for the impact on national income. If budget deficits crowd out capital, national income falls because less is produced; if budget deficits lead to trade deficits, just as much is produced, but less of the income from production accrues to domestic residents.

In addition to affecting total income, deficits also alter factor prices: wages (the return to labor) and profits (the return to the owners of capital). According to the standard theory of factor markets, the marginal product of labor determines the real wage, and the marginal product of capital determines the rate of profit. When deficits reduce the capital stock, the marginal product of labor falls, for each worker has less capital to work with. At the same time, the marginal product of capital rises, for the scarcity of capital makes the marginal unit of capital more valuable. Thus, to the extent that budget deficits reduce the capital stock, they lead to lower real wages and higher rates of profit.

Long-run effects of deficits: future taxes

In addition to their effects on macroeconomic performance, budget deficits have a more direct implication for the future: the resulting government debt may force the government to raise taxes

when the debt comes due. These future taxes reduce household incomes in two ways—directly through the tax payments and indirectly through the deadweight loss that arises as taxes distort incentives. Alternatively, if taxes do not rise, the government may be forced to cut transfer payments or other spending to free up funds to pay the debt.

By how much must taxes rise or spending fall to pay off a country's debt? This question is more tricky than it seems, for the answer depends on both policy choices and luck. One surprising fact is that the government may never need to raise taxes or cut spending at all. Instead, it can simply roll over its debt: it can pay off interest and maturing debt by issuing new debt. At first this policy might appear unsustainable, because the level of debt increases forever at the rate of interest. Yet as long as the rate of GDP growth is higher than the interest rate, the *ratio* of debt to GDP falls over time. With the debt shrinking relative to the size of the economy, the government can roll over the debt forever even as its absolute size grows. That is, the economy can grow its way out of the debt.

History suggests that a government is likely to get away with running such a Ponzi scheme. In many developed economies, the average growth rate over long periods has exceeded the average interest rate on government debt. In the United States, for example, average growth of nominal GDP from 1871 to 1992 was 5.9 percent, and the average interest rate on debt was 4 percent. If these trends continue, a policy of rolling over the debt (and using taxes to pay for current government services) will cause the debt to grow more slowly than GDP. The debt will eventually become negligible relative to the size of the economy, even with no tax increases.

Does this scenario sound too good to be true? It may be. The catch is that the future paths of interest rates and GDP are uncertain. Although interest rates on government debt have *usually* been less than the growth of GDP, these variables fluctuate. It is possible, although not especially likely, that the economy will experience a run of bad luck—say a major depression—in which the growth rate drops below the interest rate for a sustained period. In this case, a

policy of rolling over the debt will cause the debt to rise faster than national income. Eventually, the debt may become so large relative to the economy that the government has difficulty selling it, forcing a tax increase or spending cut. Moreover, these adjustments are especially painful: they are large, and they come when the economy is already suffering from a problem that has caused the debt-income ratio to rise.³

Thus a policy of rolling over the debt is a gamble: the government is likely to avoid any tax increase or spending cut, but it risks large and painful ones. Faced with this risk, the government may choose to reduce the deficit while the debt is still moderate and the economy is healthy. By raising taxes or cutting spending initially, the government can reduce the risk of more difficult fiscal adjustments later.

By how much must the government raise taxes to ensure that the debt-income ratio does not explode? One natural, safe policy is to raise taxes enough to stabilize the real value of the debt. As long as economic growth does not stop entirely, this policy will ensure that the debt-income ratio falls over time. Thus, a permanent tax increase equal to the real interest on the debt is an upper bound on the future tax burden arising from past budget deficits, assuming the government chooses to play it safe.

The size of the effects

We now turn from the qualitative effects of budget deficits to their quantitative importance. Are the effects of deficits on variables such as GDP and wages large or small? And how important are these effects compared to other phenomena, such as the worldwide slowdown in productivity growth? We focus on deficits of the size experienced in the United States, which has to date accumulated a debt of about one-half of annual GDP.

A parable

As we have discussed, government debt reduces the growth of GDP because it crowds out capital. To see how different the U.S.

economy would be if there were no debt, consider the following thought experiment. Suppose that the crowding-out process is magically reversed. One night, the debt fairy travels around and replaces every U.S. government bond with a piece of U.S. capital. How different would the world be the next morning when everyone woke up? After answering this question, we argue that it provides a good guide to the actual effects of deficits in the United States.

The debt fairy's actions would affect four key variables: the burden of debt service, the level of GDP, the real wage, and the return to capital. The simplest calculation is the reduction in the debt service. In real terms, the government has to make interest payments of rD , where D is the debt and r is the real interest rate. These interest payments must be financed with taxes, spending cuts, or additional borrowing. In the United States, the average real return on government debt is approximately 2 percent. Because debt is about half of GDP, the debt fairy's generosity would eliminate a debt service of about 1 percent of GDP.

The replacement of debt by physical capital would also raise output. Since the capital stock rises by the level of debt D , output Y rises by $MPK \times D$, where MPK is the marginal product of capital. Proportionately, output rises by $MPK \times D / Y$. In the United States, the capital share is about 30 percent, and the capital-income ratio is about 2.5, which implies an MPK of 12 percent. Thus, the creation of capital by the debt fairy raises GDP by about 6 percent.⁴

Determining the effects on real wages and the returns to capital requires some information about the form of the aggregate production function. A standard view is that the production function is roughly Cobb-Douglas. For this production function, the marginal product of labor, which determines the real wage, is proportional to output per person. Because output rises by 6 percent and the labor force is unchanged, the real wage rises by 6 percent as well.

Finally, for a Cobb-Douglas production function, the marginal product of capital is proportional to the output-capital ratio. As we have discussed, output rises by 6 percent. For a debt-income ratio

of .5 and a capital-income ratio of 2.5, the debt fairy's intervention raises the amount of capital by 20 percent. Thus, the output-capital ratio falls by about $20 - 6 = 14$ percent, implying a similar fall in the return to capital. Because the return to capital is about 12 percent per year, it falls to about 10.3 percent per year. In the longer run over which real interest rates are tied to the return to capital, real interest rates also fall by about 170 basis points.

Is this the right calculation?

Our goal is to estimate how the U.S. economy would be different today if the government had always run a balanced budget. Does the debt-fairy experiment answer this question? The experiment is exactly right under two assumptions: the economy is closed, and fiscal policy does not affect the path of net private saving. With constant saving, the sale of government debt does not alter the level of private wealth. Each dollar of government debt in savers' portfolios crowds out a dollar of capital, and there is no inflow of capital from abroad. Fiscal policy simply substitutes government debt for capital, and the debt fairy reverses this process.

What if we relax the obviously false assumption of a closed economy? In an open economy, capital inflows partly offset the crowding out of capital by debt. These inflows mitigate the effects of debt on GDP, the real wage, and the profit rate. For example, if one-third of the fall in national saving is financed with a trade deficit (a typical estimate), the fall in the capital stock is only two-thirds as large, implying that the impacts on GDP and factor prices are only two-thirds as large as estimated above.⁵ Yet, as discussed earlier, this issue is not important for calculating the effect of deficits on gross *national* product. Because GNP rather than GDP determines the living standards of a country's residents, the impact on living standards is not much altered by the capital inflow induced by budget deficits.

It is difficult to evaluate the assumption that private saving is invariant to fiscal policy. As we have discussed, private saving probably responds somewhat to public saving, and this effect

reduces the impact of budget deficits. Unfortunately, there is no consensus on the magnitude of the effect. The Council of Economic Advisers (1994) argues that the offset is close to zero on the basis of the experience of the 1980s: because private saving was low in the presence of large budget deficits, it is hard to believe it would be much lower in the absence of deficits. On the other hand, studies of countries with deficits of varying sizes suggest a private-saving offset closer to one-half (Bernheim, 1987). In light of this uncertainty, we view the results of our debt-fairy experiment as an upper bound on the effects of the U.S. debt on national income. Our best guess for the actual effect is somewhere between the debt-fairy figure of 6 percent and half of that level.

Are these effects a big deal?

Do the numbers we have presented suggest that budget deficits are a major economic problem or a minor one? Our subjective assessment is somewhere in between. Our upper bound for the effects of past U.S. deficits on current national income is 6 percent. One way to interpret this number is to remember that average real growth in income per capita in the United States is about 2 percent a year. Thus reducing GNP by 6 percent is like giving up three years of growth. In the absence of debt, the United States would have achieved its 1995 level of income in 1992. These numbers are certainly significant: 6 percent of current GNP is about \$400 billion. But waiting an extra three years to achieve any level of income is hardly a disaster.

Another way to gauge the importance of deficits is to compare their effects to those of other economic phenomena. The United States and most other industrialized nations have experienced slow growth for the last 20 years, relative to the previous three decades. This slowdown in growth is behind the widely publicized stagnation in living standards for many workers and the resulting public concern that something is wrong with the economy. The slowdown in output growth has been caused mainly by slower growth in total factor productivity. Productivity growth has fallen by about 1 percent per year, resulting today in a total shortfall relative to the past trend of about 20

percent. By comparison, the 3 percent to 6 percent fall in income due to government debt can be viewed as only a moderate problem.

Deficits and economic well-being

Having presented a positive analysis of the effects of budget deficits on aggregate economic variables, we now turn to the normative questions of whether and why deficits are undesirable. Popular discussions of deficits usually take it for granted that deficits are bad for the economy, and perhaps even immoral. Although this view can be defended, its justification is less obvious than one might think.

Economists are often tempted to use GNP as a shorthand measure of economic well-being. As we have already discussed, budget deficits do not affect GNP initially and, in the long run, reduce GNP. Thus, by the measure of GNP, deficits are unambiguously harmful. Yet this analysis of deficits is misleading, for economic well-being depends on consumption rather than GNP. While deficits do not raise GNP, they do raise consumption in the short run by lowering households' tax burden.

If one focuses on consumption as the proper measure of well-being, budget deficits come to look like a particular policy of income redistribution. Redistributions occur because of the change in the timing of taxes and because of changes in factor prices. These redistributions do not harm everyone; instead, some people gain at the expense of others. The gains and losses sum to zero, so it is not obvious that deficits are good or bad overall.

Who wins and who loses?

An analogy may be helpful in thinking about the desirability of deficits. Suppose that Californians become powerful in Congress and pass a law that reduces taxes in California and raises them in New York, leaving total taxes unchanged. This law does not benefit or harm the economy as a whole; it merely redistributes income among people. The direct effect is to benefit Californians and hurt New Yorkers. There are also likely to be general-equilibrium effects

on the incomes of various groups. For example, the shift in the tax burden from California to New York will raise the demand for surfboards and reduce the demand for opera, leading to higher profits for surfboard manufacturers and lower wages for singers. These effects are called pecuniary externalities. Assuming that markets are competitive, these pecuniary externalities sum to zero, like the direct effects of the tax change.

A policy of running deficits is similar to a pro-California tax reform: it shifts taxes between groups. Here the shift is not between taxpayers in different places but between taxpayers at different times. When the government runs a deficit, it accumulates debt that it must pay back through future taxation. Such a policy just shifts the burden of taxes: current taxpayers gain, and future taxpayers lose.⁶

Like any shift in tax burdens, deficits have general-equilibrium effects. Here the key effects follow from the crowding out of capital. The fall in the capital stock affects factor prices: wages fall, harming workers, and the returns on capital rise, benefiting capital owners. Like the effects on the surfboard and opera industries when Californians gain power, the changes in wages and profit rates are pecuniary externalities. The losses to workers from lower real wages are balanced by the gains to the owners of capital from higher rates of profit.

Thus, the winners from budget deficits are current taxpayers and future owners of capital, while the losers are future taxpayers and future workers. Because these gains and losses balance, a policy of running budget deficits cannot be judged by appealing to the Pareto criterion or other notions of economic efficiency. Instead, the key issue is whether we approve of the direction of the redistributions that this policy implies.

Are the redistributions desirable?

Economists are not good at judging redistributions of income. Indeed, they often claim that this issue is outside of the sphere of economics altogether. It is, therefore, somewhat surprising that economists decry budget deficits with such consensus and assurance.

One widely accepted standard for judging redistributions is the ability-to-pay principle: redistributions of income are desirable if they go from better-off to worse-off people. By this criterion, the redistributions arising from changes in factor prices are undesirable. Many people hold little wealth and consume the income from their wages, while a small part of society holds most of the economy's wealth. When crowding out raises the returns on capital and reduces wages, the wealthy gain at the expense of the less wealthy.

Yet, from the standpoint of the ability-to-pay principle, the direct effect of budget deficits—the change in the timing of taxes—is harder to reconcile with the conventional view that deficits are undesirable. Because of technological progress, the income and consumption of a typical individual in the economy rises over time. Because budget deficits shift taxes forward in time, they benefit relatively poor current taxpayers at the expense of relatively rich future taxpayers. If reducing inequality is a goal of policy, shouldn't budget deficits be applauded?

One way to answer this question is to go beyond neoclassical economic theory. Although standard models assume that people desire to smooth consumption evenly over time, popular discussions of economic policy presume that consumption should rise over time. Politicians often assume a moral imperative that the current generation sacrifice to ensure that future generations enjoy a substantially higher standard of living. This view suggests that it is undesirable to shift a tax burden onto our children, even though our children will be better able to shoulder that burden than we are.

Another possible answer is that levels of taxation should be based on the benefits principle, which holds that people should pay for the government benefits that they receive. For example, the use of a gasoline tax to pay for road repair is not based on the abilities to pay of drivers and non-drivers; instead, it is justified on the ground that drivers should pay for roads because they benefit from them. Similarly, one might argue that each generation should pay for the government it provides itself, regardless of its level of income.

These issues are not easily resolved. Yet one point is clear: saying whether and why deficits are undesirable requires judgments that are more philosophical than economic.

Should you worry about deficits?

A related question is whether an individual needs to rely on politicians to avoid the future suffering caused by budget deficits. Suppose you are worried about the effects of deficits on your children, and aren't confident that Bill Clinton and Newt Gingrich will take care of the problem by balancing the budget. You can eliminate your worries simply by saving and leaving a larger bequest to your children, so that they can bear the burden of future taxes without reducing their consumption.

Some economists—advocates of Ricardian equivalence—claim that people do in fact behave this way. If this were true, private behavior would fully offset the effects of public dissaving. Although we doubt that most people are so far-sighted, some people probably do act this way, and anyone *could*. Deficits give you the chance to consume more at the expense of your children, but they do not require it.⁷

Indeed, if you are forward looking and care about your children, deficits can *benefit* your family. You can insulate yourself from the effects of tax shifting through a larger bequest. And, since you are accumulating more capital than the typical family, you and your children are among the winners from deficit-induced changes in factor prices. That is, you benefit from the higher rates of return that deficits cause.

So why should you the reader—a person who we assume both loves his children and understands the effects of deficits—worry about balancing the budget? Once again, answering this question requires going beyond standard economic theory. One possible answer is paternalism. You can protect your children from deficits, but you know that some irresponsible parents will exploit their children to raise their own consumption. You may care about protecting these children's standard of living even though their own parents do not.

Alternatively, there may be externalities from the effects of deficits that do not appear in standard economic models. Paul Romer (1987) and, more recently, Bradford DeLong and Lawrence Summers (1991) have suggested that the accumulation of capital stimulates technological change and increases economy-wide productivity. If so, then the crowding out caused by deficits depresses national income by more than our calculations above suggest. In addition, no single family can insulate itself from these effects through higher private saving.

Another possible externality may arise from the distribution of income. As discussed earlier, deficits redistribute income from wage earners to capital owners, creating greater dispersion in wealth and income. Perhaps widening inequality is undesirable even for the rich. A large poor population might raise crime rates and otherwise threaten the living standards of the wealthy. The fact that most people—both rich and poor—prefer to live in rich communities suggests that people care about their neighbors' living standards for not entirely altruistic reasons.

A related consideration is that people often care about the incomes of their fellow citizens relative to citizens of other countries. If large deficits reduce the U.S. growth rate, the average American standard of living may fall behind that in Japan. It is not obvious why this matters—why we do not care just about our own standard of living. Perhaps a nation's relative income matters because it affects some sense of national prestige. Perhaps it matters because it affects national power in world politics. Again, judging the desirability of deficits leads to questions that economists are not particularly qualified to address.

A hard landing?

Numerical results suggest that the effects of budget deficits are moderate in size. Moreover, since there are winners as well as losers, it is not obvious that deficits are undesirable overall. These conclusions suggest that popular concerns about budget deficits are overblown, at least when the national debt is at its current U.S. level relative to national income.

Matters start looking more serious if one looks ahead to future fiscal policy. There are reasons to worry that debt-income ratios are headed upward around the world. Many countries, including the United States, project large deficits because of growing expenditures on programs for the elderly, such as social security and Medicare. According to some projections, under current programs, the U.S. debt-income ratio will reach five in 2025! Of course, the future is uncertain: we may be saved from rising debt-income ratios by fiscal tightening or by good luck such as high growth in income or containment of medical costs. But what if the debt-income ratio does keep rising?

Part of the answer is clear: the effects we have already discussed are magnified. We have calculated that past U.S. deficits—which have produced a current debt-income ratio of about one-half—reduce current GNP by 3 percent to 6 percent. If the ratio rises to one, the effect will rise to 6 percent to 12 percent.

Yet, if the debt-income ratio continues to rise, there may also be additional effects which are qualitatively different from those the economy is now experiencing. In particular, a rising debt-income ratio in a country may at some point lead to a sharp decrease in demand for the country's assets arising from a fall in investor confidence. In this section, we discuss how such a "hard landing" might come about and the possible effects on the economy. Our discussion is necessarily speculative. As far as we know, no major industrialized country has ever experienced a hard landing of the sort we will describe. But keep in mind: no major industrialized country has persistently run large budget deficits in peacetime—until recently.⁸

How a hard landing might occur

Why might the demand for a country's assets fall? There are two distinct but complementary stories about how a rising national debt could lead to lower demand for domestic assets.

The first story emphasizes the effect of deficits on a country's net-foreign-asset position. As we have discussed, budget deficits

tend to produce trade deficits, which a country finances by selling assets abroad. Yet there may be limits to the quantity of domestic assets foreigners are willing to hold. For various reasons (such as lack of information, exchange-rate risk, or sheer xenophobia), international diversification is far from perfect. This fact is consistent with the finding of Feldstein and Horioka (1980) that a country's saving roughly balances its investment over long periods. As a country's net-foreign-asset position deteriorates, foreign investors may become less and less willing to purchase additional domestic assets.

A second story is that a rising level of government debt makes investors fear government default or a similar policy aimed at holders of domestic assets. Unlike the first story, this story is relevant even if a country has not reached a negative net-foreign-asset position. And in this story, domestic as well as foreign investors flee domestic assets.

In speculating about a loss of investor confidence, one is naturally led to draw on the experience of the debt crisis in less developed countries (LDC) during the 1980s. (The case of Mexico in 1994 is less relevant, because it involves imprudent monetary and exchange-rate policy as well as debt.) In the LDC debt crisis, capital inflows in the form of bank loans dried up when countries began having trouble servicing their debts, leading to fears of widespread default. It is tempting to imagine that this experience is not relevant to countries like the United States—that rich countries would never default. But Orange County, California is even richer than the United States, and it is about to default on its debt. Orange County voters, turning down a tax increase needed to honor the debt, appear to reject the idea that they should pay for their government's mistakes. It is easy to imagine such arguments at the national level—or at least a fear on the part of investors that such arguments will arise.

There is, however, a reason that the LDC debt crisis is an imperfect guide to hard landings in the United States or European countries. The Latin American debt was external: it was owed to foreigners. Thus the direct effect of default was a loss to foreigners, making default a relatively attractive way out of a fiscal crisis. The same is

true for Orange County: most of its debt was owned outside of the county. In the United States, by contrast, most of the national debt is owned by American citizens.

Since an internal debt makes default less tempting, it is likely to delay a hard landing: it takes a higher level of debt to spook investors. The fact that a debt is internal also affects the nature of the prospective policies that might spark a hard landing. If the debt-income ratio spins out of control, something must be done or default is unavoidable. And it might remain impossible politically to raise income taxes sufficiently. One possible outcome is a general tax on wealth. The government might require owners of its bonds to “share in the sacrifice” through partial default, but it would also tax the holders of other assets. The tax could extend to foreign owners of domestic assets to reduce the burden on domestic citizens.

An unsustainable path of debt and a worsening net foreign asset position could lead investors to fear other unpleasant consequences as well. Extensive foreign ownership of U.S. assets could lead to restrictions on capital outflows. Perhaps as debt grows and wages fall relative to those of other countries, political outrage will produce a government that increases interference in the economy. Many U.S. politicians, for example, are tempted to blame domestic problems on Japanese trade practices; a trade war is not an unthinkable result of a general decline in living standards. Similarly, many less developed countries have unhappy histories in which economic problems create political pressures for policies that discourage investment and make the problems even worse. Fear of these outcomes—or just a belief that *something* bad must happen if debt continues to grow—could lead to a fall in the demand for domestic assets.

In principle, the decrease in demand for domestic assets could be gradual, with the assets slowly becoming less popular as the fiscal situation deteriorates. The history of financial markets suggests, however, that shifts in investor confidence can be sudden, with the timing driven by self-fulfilling expectations. A flight from domestic assets could occur at a seemingly arbitrary point in time, much as the 1987 stock market crash did. Or a hard landing could be triggered

by adverse events. In the Latin American case, the worldwide recession of the early 1980s caused investors to revise downward their expectations of growth and, hence, the likelihood of repayment. Similarly, a crisis in the United States might be triggered by bad news about income growth, which would imply higher debt-income ratios for given fiscal policies.

Since a hard landing involves the psychology of markets, it is hard to judge when it might occur. The debt crisis hit Latin American countries with debt-income ratios below the current U.S. level of one-half, but these countries had external debts and hence a greater temptation to default. In addition, interest rates were much higher for the Latin debt than for the U.S. debt, so the path of debt was potentially more explosive. High debt-income ratios in developed countries have previously occurred only in wartime, when they were clearly temporary. Recent peacetime increases in the ratio are taking the United States and other countries into uncharted territory, so it is impossible to say whether a hard landing is around the corner or still far off.

The costs of a hard landing

If confidence in a country's assets collapses, what happens to the economy? Theory and the experiences of LDCs give some guide as to the effects. The decline in the demand for domestic assets leads to a sharp fall in the prices of these assets, including a fall in the stock market. Interest rates and other asset yields rise. The value of the domestic currency falls as investors sell the currency they acquire from selling domestic assets. As the currency depreciates, the trade balance turns sharply toward surplus, and capital flows out of the country.

Such a hard landing potentially harms an economy in many ways. Most obviously, wealth falls because of the decline in asset prices. The lack of investor confidence and higher interest rates lead to lower levels of physical investment, and eventually a lower capital stock. This effect exacerbates the decline in real wages caused by budget deficits.

A number of other consequences might follow as well. Indeed, hard landings are hard to think about because things can go wrong in such a rich variety of ways. First, the rise in interest rates during a hard landing would likely exacerbate the fiscal crisis by causing the debt to grow rapidly. To avoid a greater disaster, the government would have to shift abruptly to primary budget surpluses, causing a sharp fall in consumption. That is, high interest rates would eliminate the possibility of growing out of a debt or paying it off slowly.

Second, the Latin American experience suggests that the shift in the trade balance toward surplus would be a major sectoral shock. The debt-crisis countries experienced a large shift from nontradeables to tradeables, causing high unemployment in non-tradeables. According to some observers, the sectoral shock brought growth to a standstill for a decade. See Sachs and Larrain (1993).

Third, the hard landing could lead to inflation through two distinct channels. The drop in the domestic currency would directly push up the prices of imports, which could trigger continuing inflation if monetary policy is accommodative. And, in response to the fiscal crisis, the monetary authority may feel increased pressure to raise revenue through money creation. Both these effects were important in producing high inflation in Latin America after the debt crisis. We can hope that the central banks of developed countries would hold the line against inflation even in a crisis. But if the crisis brings extremists to power, who knows?

Finally, a hard landing could trigger a general financial crisis. Declines in asset prices and increases in firms' interest burdens would increase bankruptcies. Bankruptcies of firms could trigger financial distress for the banks that lend to them. In the worst case, these problems and the resulting contraction of credit would build on each other and financial intermediation would break down. As in the 1930s, the economy could plunge into a depression.

A call for prudence

Previous sections of this paper have described well-understood and quantifiable effects of budget deficits, such as crowding out of capital and intertemporal shifts in tax burdens. By contrast, this section has been highly speculative. We can only guess what level of debt will trigger a shift in investor confidence, and about the nature and severity of the effects. Despite the vagueness of fears about hard landings, these fears may be the most important reason for seeking to reduce budget deficits. If the main effects of deficits are moderate redistributions across generations and groups of people, perhaps they should not be a central concern of policymakers. But as countries increase their debt, they wander into unfamiliar territory in which hard landings may lurk. If policymakers are prudent, they will not take the chance of learning what hard landings in G-7 countries are really like.

Author's Note: We are grateful to Michael Rashes for research assistance and to the National Science Foundation for financial support.

Endnotes

¹Economists of the “Ricardian” school argue that consumers save 100 percent of a debt-financed tax cut, which implies that deficits have no effect on national saving. Like most economists, we believe the added private saving is much smaller than the full tax cut. For descriptions and critiques of the Ricardian position, see Bernheim (1987) and Gramlich (1989).

²At least since the 1960s, most economists have agreed that budget deficits create trade deficits by causing the domestic currency to appreciate. Yet within the past year, journalists and policymakers have argued that budget deficits cause a *depreciation* of the currency. In particular, the fall in the dollar in the first half of 1995 was widely blamed on low national savings arising from U.S. deficits. A *New York Times* headline proclaimed “Save the Dollar: Encourage Saving.”

Can one make sense of this recent view? As far as we can see, the only channel through which budget deficits could weaken the domestic currency is increased fear of the “hard landing” discussed in the fourth section of this paper. A sharp fall in investor confidence could cause a fall in the demand for domestic assets, outweighing the direct effect of deficits. We are doubtful, however, that this is the right explanation for the recent fall in the dollar. Early 1995 was a period in which the likelihood of a hard landing may have *fallen* due to increased interest in budget balancing by both political parties.

We suspect, therefore, that recent views about deficits and the dollar are simply fallacious. Since budget deficits are generally viewed as irresponsible policies, it is tempting to blame them for any undesirable event, even in the absence of a logical connection. Note that if budget deficits weaken the dollar, they also reduce rather than increase the trade deficit, an unappealing implication that is ignored in recent discussions.

³Ball, Elmendorf, and Mankiw (1995) use the historical behavior of growth rates and interest rates and estimate the probability of this event at 10 percent to 20 percent, under the assumption that the debt-income ratio begins at roughly its current level.

⁴These calculations ignore the fact that the marginal product of capital would fall as the level of capital rises. Formally, this means that our numbers are first-order approximations to the effects of raising the capital stock.

⁵Feldstein (1992) suggests that about 25 percent of a budget deficit is typically financed by a trade deficit, while the Council of Economic Advisers (1994) suggests 40 percent. At first glance, the U.S. experience summarized in Table 1 suggests a larger number, since most of the fall in national saving after 1982 was financed by a trade deficit. Yet there are probably other factors that boosted investment and raised the trade deficit over this period. The fact that the stock market boomed during a period of high real interest rates suggests increased investor confidence about future profitability.

⁶As discussed earlier, it is possible that a government might attempt to run a Ponzi scheme by forever rolling over its debt and accumulating interest. If such a scheme succeeds, then deficits do not lead to higher future taxes. In this case, a policy of running deficits can yield a Pareto improvement, for current taxpayers benefit without any loss to future taxpayers. This possibility, however, should not be construed as an argument in favor of budget deficits, for an attempted Ponzi scheme may fail, in which case the future tax increases are especially large and painful. For further discussion of these issues, see Ball, Elmendorf, and Mankiw (1995).

⁷Herschel Grossman (1995) makes a similar argument.

⁸Here we draw on previous discussions of hard landings by Krugman (1991, 1992) and Summers (1991).

References

- Ball, Laurence, N. Gregory Mankiw, and Douglas W. Elmendorf. "The Deficit Gamble," NBER Working Paper No. 5015, February 1995.
- Bernheim, B. Douglas. "Ricardian Equivalence: An Evaluation of Theory and Evidence," *NBER Macroeconomics Annual* 2 (1987), pp. 263-304.
- Council of Economic Advisers. *Economic Report of the President*, 1994.
- DeLong, J. Bradford, and Lawrence H. Summers. "Equipment Investment and Economic Growth," *Quarterly Journal of Economics* 106 (1991), pp. 445-502.
- Feldstein, Martin. "The Budget and Trade Deficits Aren't Really Twins," NBER Working Paper No. 3966, January 1992.
- _____, and Charles Horioka. "Domestic Saving and International Capital Flows," *Economic Journal* 90 (1980), pp. 314-29.
- Friedman, Benjamin M. *Day of Reckoning: The Consequences of American Economic Policy Under Reagan and After*, Random House, 1988.
- Gramlich, Edward M. "Budget Deficits and National Saving: Are Politicians Exogenous?" *Journal of Economic Perspectives* 3 (Spring 1989), pp. 23-35.
- Grossman, Herschel I. "American Fiscal Policy in the 1990s," NBER Working Paper No. 5109, May 1995.
- Krugman, Paul. "Financial Crises in the International Economy," in Martin Feldstein, ed., *The Risk of Economic Crisis*. (Chicago: The University of Chicago Press), 1981.
- _____. *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s*. (Cambridge, Mass.: MIT Press), 1992.
- Romer, Paul. "Crazy Explanations of the Productivity Slowdown," *NBER Macroeconomics Annual* 2 (1987).
- Sachs, Jeffrey D., and Felipe Larrain. *Macroeconomics in the Global Economy*. Prentice Hall, 1993.
- Summers, Lawrence H. "Planning for the Next Financial Crisis," in Martin Feldstein, ed., *The Risk of Economic Crisis*. (Chicago: The University of Chicago Press), 1981.

