Debt, Deficits, and the Economy

John J. Seater

When conversation turns to the economy, one of the most popular topics of discussion is the government deficit. Newspaper columnists, TV pundits, and of course politicians never tire of talking about the size of the deficit and what it means for the economy. Big deficits are considered bad - except that back in the 1950s and 1960s, they often were considered good. Big deficits depress the economy because they drive up interest rates - except that back in the 1950s and 1960s, the usual argument was that deficits stimulated the economy by encouraging people to spend more. So which is it: Are deficits good or bad? Do they depress or stimulate the economy? To answer those questions, we have to answer a more fundamental question: Exactly what is the government deficit? Once we know that, we can proceed to the more interesting questions of how deficits affect the economy and whether they are good or bad.

Debt and deficits: What are they?

The deficit is the addition to the outstanding stock of government debt, so to understand what the deficit is, we first have to understand what government debt is. The government undertakes many activities, from national defense to providing medical insurance. To pay for them, the government usually collects taxes. Sometimes, though, the government prefers to postpone collecting part of the taxes it needs and instead borrows funds by selling government bonds to the public. Those bonds, just like a corporate bond, represents a loan the government has taken out and eventually will repay. The person who buys a government bond hands over money to the government and in return gets a bond stating the amount of the loan (the “principal” or “face value” of the loan), the interest rate that will be paid on the loan, and the date when the principal will be repaid (the “maturity date” of the loan). The money paid to the government by the buyer of the bond is that person’s loan to the government, and the bond is the contract stating the terms of the loan. The “government debt” is the total amount of bonds that the government has issued but not yet repaid.

Whenever current government expenditure exceeds tax revenue, the government borrows the difference by selling new bonds to the public. In such a situation, the government budget is said to be in deficit. The amount of new debt
issued in a given period of time (such as a calendar year) constitutes the deficit for that period. In contrast, when expenditure is less than tax revenue, the government budget is in surplus. At any time, the deficit is the negative of the surplus and vice versa.

**How much government debt is there?**

At the end of 2009, there was about $12.3 trillion of federal debt outstanding. Of that, 43% ($5.3 trillion) was held by federal agencies and trust funds, which means that the government owed almost half the debt to itself. Such internal debt is only a bookkeeping device for tracking the flows of funds within the federal government. An accurate analogy would be a household in which one child borrowed money from a sibling. That kind of intra-family debt has no bearing on the family’s net indebtedness and is ignored by credit rating agencies, banks, credit card companies, and so forth. The situation with respect to intra-government debt is exactly the same: as far as the economy is concerned, that debt doesn’t exist. It has no implications at all for the economy or public welfare. Unfortunately, popular discussions of the debt frequently fail to distinguish between internal and external government debt and thus overstate the relevant number, which is the amount of federal debt held by private investors. At the end of 2009, that amount was about $7.0 trillion. State and local governments also issue debt, and they have about $2.4 trillion in outstanding debt, most of which was held by private investors. Thus, the total amount of privately held government debt was about $9.4 trillion at the end of 2009.

Until about the mid-1980s, government debt as a fraction of gross domestic product (GDP) of the U.S. economy was not especially large except during wars and immediately after them. At the end of the Second World War, for example, outstanding federal debt alone (i.e., ignoring state and local debt) was slightly larger than GDP and then fell substantially over the next two or three decades. The federal government always has issued debt to cover part of the abnormally high level of government purchases during wars and then paid off the wartime debt in the following peacetime. By using debt to finance unusually high purchases during wars, the government avoids large fluctuations in tax rates, which would have adverse effects on economic activity. Since the mid-1980s and especially since the end of 2008, government debt has grown substantially relative to GDP. That growth is unusual because it resembles wartime debt behavior but has occurred in the absence of any major war. At the end of 2009,
US GDP was about $14.3 trillion, so the ratio of total, privately held outstanding government debt to GDP was about 76%. That is still below the debt-to-GDP ratio at the end of 1945, but it is growing unusually fast and, unlike a war, is accompanied by no expectation of reduced future government expenditure to lead to a retirement of the debt without increases in tax rates. Note that we are restricting attention here to privately held federal, state, and local debt because that is the debt that matters to taxpayers and the economy in general. The figure one usually sees in the news refers only to federal debt but includes debt held by federal agencies as well as by private individuals. Total outstanding federal debt at the end of 2009 was $12.3, equal to 86% of 2009's GDP of $14.3.

The foregoing numbers on the amount of outstanding government debt are the numbers one would see in the newspaper. They must be adjusted before they can be used to discuss the effect of debt on the economy.

The most important adjustment is for inflation. The *nominal* value of a bond is the price in dollars that it would fetch on the open market. The *real* value of that same bond is the number of units of output that it can buy. If DVD movies cost 20 dollars each, then the real value of a $200 bond is 10 DVD movies. In other words, if you sell your bond, you will receive in return enough cash to buy 10 DVDs. If, however, the prices of all goods double, so that DVDs now cost 40 dollars each, then the bond’s cash value now buys only 5 DVDs. The bond's nominal value is unchanged by inflation and remains at $200. Its real value, however, is changed. Real values are what matter because people what people care about is how many goods their paper assets can buy. That is precisely what the real value of a bond measures. Adjusting official debt and deficit figures for inflation can change the measurement of the debt's size by a substantial amount. In 1947, for example, official federal government statistics report a surplus of $6.6 billion. However, inflation that year was almost 15 percent. That inflation reduced the value of outstanding debt by about $11.4 billion. That reduction was equivalent to an additional surplus because it reduced the real value of what the federal government owed its creditors. The true surplus, therefore, was about $18 billion, nearly three times as high as the official figure. Another example is the decade of the 1970s, during which the official federal deficit was positive every year but the inflation-corrected deficit was negative (that is, there was a real surplus) in exactly half those years.

Another adjustment is for changes in interest rates. The value of outstanding debt changes as market interest rates change. To see what is
involved, suppose that you buy a one-year $10,000 Treasury bill (equivalently, you make a loan of $10,000 to the federal government) at 10:00 am. The bond carries an interest rate of 10 percent, which means you will be paid $1000 in interest when the bond matures one year from now. At 11:00 am, the Federal Reserve announces a change in monetary policy that causes one-year interest rates to fall to 9 percent. Your bond now is worth more than when you bought it an hour ago because you could now sell the bond to someone else for more than $10,000. The reason is that anyone who wants to lend $10,000 for one year now will find that new bonds pay only 9 percent, meaning an interest payment in one year of $900. Your “old” bond, however, has a 10 percent rate locked in and will pay $1000 interest for sure. That makes your bond's market value higher than its par value of $10,000. These kinds of changes happen continually, day in and day out. As a result, the market value of the outstanding government debt fluctuates from day to day even if there is no inflation and even if the government issues no new debt and retires no outstanding debt. The market value of outstanding debt will be greater than the par value if interest rates have fallen on average since the debt was issued and will be smaller than the par value if rates have risen. The difference between par and market value of the outstanding debt is typically a few percentage points. Unfortunately, market values for the total outstanding government debt are not readily available. Governments do not report them, and newspaper reports rarely mention them.

The economic effects of government debt.

To see how government debt may affect the economy, we need to understand how government debt affects the flow of net income to the people lending to it. When the government borrows, it promises to repay the lender. To make those repayments, the government ultimately will have to raise extra taxes, beyond what it needs to pay for its other activities. The economic effect of government debt depends heavily on how taxpayers perceive those future taxes. Perceptions are difficult to measure, and neither economists nor others understand exactly how people form their perceptions. As a result, economist still disagree on the economic effect of government debt.

A simple example will help illustrate the situation. Suppose the government buys $1 trillion worth of goods and services every year and pays for them entirely by collecting taxes. The government's budget is balanced because revenue equals expenditure. Suppose that the government decides to change the
way it finances its expenditures but does not change the amount being spent. In
the first year, the government reduces taxes by $100 billion and replaces the lost
revenue by selling $100 billion worth of bonds that mature in one year and carry
an interest rate of 10 percent a year. In the second year, the bonds mature, and the
government pays the $100 billion principal and the $10 billion of interest. Taxes
in the first year are $100 billion lower (the government is running deficit), but in
the second year are $110 billion higher (the government is running a surplus).
How does this rearrangement of the timing of tax collections affect people? In
the first year, people give the same total amount of revenue to the government as
they did when they paid only taxes, but now $100 billion of the total payment is
in the form of a loan that will be repaid in the second year with an extra $10
billion in interest. On this account, people may feel richer because they seem to
be paying less in total taxes over the two periods. This year, they pay $900
billion in taxes and $100 billion in loans, for the same $1 trillion total that they
were paying before the government decided to issue debt. Next year, however, it
seems they will be better off than before. They will pay $1 trillion in taxes but
they will receive $110 billion in repayment of their first-year loan. Their net
payment in the second year will be only $890 billion. This seems like a good
deal, but unfortunately it won’t turn out that way. When the second year arrives,
people will find that their net payment is $1 trillion, just as if the debt never had
been issued. Why is that? To pay the $110 billion in principal and interest, the
government must come up with an extra $110 billion in revenue, so it must raise
taxes by that amount. Those extra taxes exactly cancel the payment of the
principal and interest! The government gives with one hand and takes away with
the other. The net result is that people don’t really get back the $100 billion they
lent the government or the $10 billion in interest on it, and the loan is equivalent
to having paid the $100 billion in taxes in the first year. The same result holds
from any maturity of debt, whether it is a one-year bond, as in the previous
example, a ten-year bond or even a perpetuity.

Note, by the way, that the government cannot beat the mathematics by
refinancing old debt with new debt. If the government tried to repay existing
debt, including the interest on it, by issuing new debt, the amount of debt would
grow at the rate of interest. In our example, in the second year the government
owes $110 billion in principal and interest on the debt issued in the first year.
The government could raise the revenue by issuing $110 billion in new debt. It
then would have to pay $121 billion in principal and interest in the third year
($110 billion in principal and $11 billion in interest, assuming the interest rate
stays at 10 percent for simplicity). Thus the debt would grow by 10 percent every
year that the government issued new debt to repay the old debt. The problem is that interest rates generally exceed the growth rate of the economy, so in finite time the government would reach a point where it was issuing debt equal in value to the entire gross domestic product of the economy. After that, it would not be able to issue any new debt because the government would be promising to repay more than could possibly be available to it, and the scheme would come to an end.

There are two major factors determining how government debt affects the economy. One is the kind of taxes the government uses to collect revenue, and the other is the way that people perceive the future taxes implied by current debt. It is easiest to start with people’s perceptions in a simple case and then move on to the more complicated case that actually confronts us.

Let’s suppose for a moment that taxes are very simple. In particular, let’s suppose that the government uses what are called lump-sum taxes to finance everything it does. A lump-sum tax is one whose amount is independent of anything the taxpayer does. For example, he could draw a number out of a hat, and that would be his tax, irrespective of whether he was rich or poor. Actual taxes are more complicated, usually being based on income, consumption, or some form of wealth. The taxpayer has some influence over how much of those kind of taxes he pays because he can control how much income, spending, and wealth he has. For the moment, though, let’s concentrate on the simple even if unrealistic case of a lump-sum tax. In that simple case, government debt is unlikely to have any significant effect on the economy. People generally try to estimate their future income, and of course what they care about is their income after taxes. That means that in effect they try to estimate their future taxes. As we have seen already, any government debt issued today implies extra taxes at some time in the future. If people are aware of that fact, then they will see that any reduction in today’s taxes brought about by the government issuing new debt is going to be offset by more taxes in the future. Our example above showed that the offset is exact. The question is whether people recognize at least approximately that the offset is exact. If they do, then bond finance is equivalent to tax finance, as our example above showed. In that case, government debt has no effect on anything important, a property known as “Ricardian equivalence,” after David Ricardo, the economist who first discussed it. If people do not foresee all the future taxes implied by government debt, then they feel wealthier when the debt is issued but poorer in the future when, unexpectedly, they have to pay higher taxes to finance the principal and interest payments. They then are
likely to increase their consumption expenditure today and perhaps work less today. In the future, when the inevitable taxes arrive, they will have to reduce their consumption and increase their work effort. So if people do not correctly perceive the future taxes implied by current debt, they will alter their economic behavior when debt is issued or retired and thus affect the economy.

The situation becomes more complicated when we extend our examination to include the fact that taxes are not lump-sum. Taxes in the real world take some fraction of the “tax base,” which is the thing taxed - income for an income tax, consumption purchases for a sales tax, and so on. To keep the discussion simple, let’s restrict the story to an income tax by supposing that is the only kind of tax the government uses. The principles are the same for other taxes, so nothing important is lost by this simplification. The problem with taxes that are not lump-sum, such as an income tax, is that they have positive marginal tax rates. The “marginal tax rate” is the fraction that you must pay in tax on the next dollar of income that you earn. A proportional income tax, for example, levies a fixed rate on your income, no matter how high or low you income is. If the marginal rate were 20%, then you would pay 20 cents on every dollar that you earn, whether you earn $10,000 or $10,000,000. Everybody would pay exactly 20 percent of their income in taxes. This is the so-called “flat tax.” Some state governments levy that kind of income tax. A graduated or progressive income tax is one whose tax rate rises with the income of the taxpayer. The federal income tax is that type of tax. Somebody earning $20,000 has a marginal tax rate of 15 percent, so if he earns another dollar, he will pay 15 cents of it to the federal government in tax. In contrast, someone earning $200,000 has a marginal rate of 35 percent and will pay in tax 35 cents of the next dollar he earns. For our purposes, it is sufficient to consider a proportional income tax, with the same marginal tax rate for everyone.

The important thing about marginal tax rates is that they affect people’s economic behavior. People’s choices depend on the tax rate they face. Think of someone trying to decide whether to work an extra hour. Suppose he earns $30 an hour. If there were no tax, then one more hour of work will earn him $30, pure and simple. If, in contrast, he is in the 15 percent tax bracket, he will get to keep only 85 percent of his extra $30 dollars, which is $25.50. The other $4.50 goes to the government as tax. Thus the effective return to working another hour is not the stated $30 but the after-tax earning of $25.50. It is less attractive to work an hour for $25.50 than for $30, so fewer people would end up deciding to work when there is a tax compared to when there isn’t. The same reasoning holds for
investment. People will be less likely to make the “next” investment (buying a new machine for their machine shop, for example) because the return on that investment is reduced by the tax.

So what does this all have to do with government debt? Remember that debt rearranges taxes over time. It therefore also rearranges the incentive effects associated with those taxes. For example, if the government reduces taxes today by issuing debt, in reality the taxes it reduces will be income taxes, not lump-sum taxes. Thus by issuing debt the government will reduce the disincentive effects of taxes today and increase them tomorrow. As a result, the government will affect the timing of people’s economic decisions. The effects of rearranging disincentive effects over time get to be quite complicated, but the important thing for our discussion here is that, precisely because debt does rearrange taxes and their disincentive effects over time, it has real effects on the economy. The situation becomes even more complicated if people cannot figure out exactly what the new timing will be after debt is issued. No one really knows when the government will collect the taxes to repay a new 30-year bond. It may decide to retire the bond early, or it may decide after 30 years to replace it with another bond, say a 5-year note, thus postponing the repayment by 5 years. In the face of such uncertainty, figuring out exactly what the incentive effects will be can become extremely complicated.

Unfortunately, there is no reliable way to discover people's expectations about taxes, so we have to use statistical methods to learn the effect of government debt on the economy. Even though economists have been studying this issue for nearly 40 years, they have not yet reached a consensus. Statistical measures of the effect of debt on economic activity are straightforward in principle but difficult to carry out in practice. Overall, though, the evidence is that debt’s effects are not strong. Some of the evidence even favors Ricardian equivalence (no effect of debt at all) as a close approximation. For example, Figure 1 shows two plots. One is the federal deficit as a share of GDP, and the other is the real interest rate on 3-month Treasury bills. There is no obvious relation between the two series, and the correlation between them is a virtually non-existent negative 1%.

A related issue here is the desirability of deliberately using deficits to influence the path of the economy. Under full equivalence of deficit and tax finance, no such thing can be done, of course, because deficits don’t affect anything important. Under incomplete equivalence, though, deficits do have
effects, as we have just seen. Therefore, it might seem desirable to run up deficits in recessions to encourage people to spend more and run up surpluses in booms to restrain spending. The problem is that these seemingly desirable effects arise for undesirable reasons: the taxes distort choices and, on top of that, people may fail to perceive the effects of future taxes implied by deficits. Any such misperception means that deficits have effects in part because they fool people into thinking they suddenly have become wealthier (and conversely for surpluses). Is it desirable to influence the path of the economy by using a policy that is effective because it deliberately misleads the public? Such a proposition seems difficult to justify. Another problem is that any desirable effects are accompanied by other effects that might not be deemed desirable. When equivalence is incomplete, changing the stock of debt outstanding also changes the interest rate in the same direction. In particular, running a deficit in a recession would raise interest rates, which would reduce investment and economic growth, which in turn would reduce output in the future. Thus using deficits to stimulate the economy now to ameliorate a recession comes at the cost of reducing output later. Whether that is a good exchange is not obvious and requires justification.
Governments issue several types of debt, which can be classified in various ways. One classification is by the type of government that issued the debt. In the U.S., the main divisions are federal, state, and local debt; local debt can be divided further by type of locality, such as county or city. A second classification of government debt is by maturity at the time of issue. When we talk about a ten-year bond or a 30-year bond, we are talking about the length of time between the date when the bond was first issued and the date on which the principal will be repaid. Federal debt is divided into three convenient maturity categories. Treasury bills have initial maturities of one year or less (“three month bills,” “year bills,” etc.); Treasury notes have initial maturities between one and ten years; and Treasury bonds have initial maturities longer than ten years. State and local government securities generally are just called bonds, irrespective of the initial maturity. A perpetuity is a bond with an infinite maturity, which means the principal is never repaid and interest payments are made forever. The British government once issued some perpetuities, calling them “consols.” A third way of classifying government securities is by the source of the revenue to repay them. “General obligation bonds” will be repaid with revenue collected by taxing the public; “revenue bonds” will be repaid with revenue collected from specific user fees, such as bridge or highway tolls. This way of classifying debt is used only for state and local debt.
Sidebar #2

There is an inconsistency in popular discussions of government debt compared to other types of debt. Corporations and households both issue debt (that is, borrow money). Corporate debt outstanding was about $7.3 trillion at the end of 2009, about $2 trillion less than the amount of privately-held government debt. Household debt is larger. In 2009, households’ total debt stood at $13.4 trillion, 43% larger than the privately-held government debt. Commentators regularly express concern that government debt represents a risk to the economy, once in a while express similar concerns about household debt, and virtually never even mention corporate debt. In fact, household and corporate debt can represent an economic risk in some rather rare circumstances, but government debt virtually never represents such a risk. In a deep recession, debtors may become unable to repay their debts and be forced to default on them. That, in turn, can make financial institutions insolvent and lead to a collapse of the financial system. Such a mechanism seems to have been the reason the recession of 1929 became the Great Depression of 1932. Deflation made existing debt increasingly costly to repay, leading to widespread defaults on debt. The banking system came under great pressure and eventually collapsed with the banking panic of 1932. This sort of thing happened from time to time up through the Great Depression but has not happened since, largely because of regulatory changes and an improved understanding by the Federal Reserve system of how to conduct monetary policy in the face of such circumstances. Such a collapse may nearly have happened in the financial turmoil of late 2008 when the market for collateralized debt obligations (CDOs) fell apart. CDOs were a new type of instrument that fell outside the regulatory structure that had worked so well since the Great Depression. Their emergence combined with other changes in the financial industry, such as the rise in importance of Fannie Mae and Freddie Mac, that also were outside the post-Depression regulatory structure. Strong action by the Federal Reserve System prevented a deflation that could have caused a repetition of the asset market crash that started the Great Depression. In contrast, default by any level of government in the United States has been exceedingly rare, and the federal government has never defaulted on its debt obligations. However, the unprecedented peacetime rise in the amount of outstanding federal debt in 2009 and 2010 raised concerns - unresolved at the time of this writing - about the federal government's ability to repay its debt.
Figure 1. Federal deficit/GDP ratio and the real interest rate on 3-month Treasury bills.