

Fletcher School, Tufts University

14. Fiscal Policy and the Government Budget Constraint

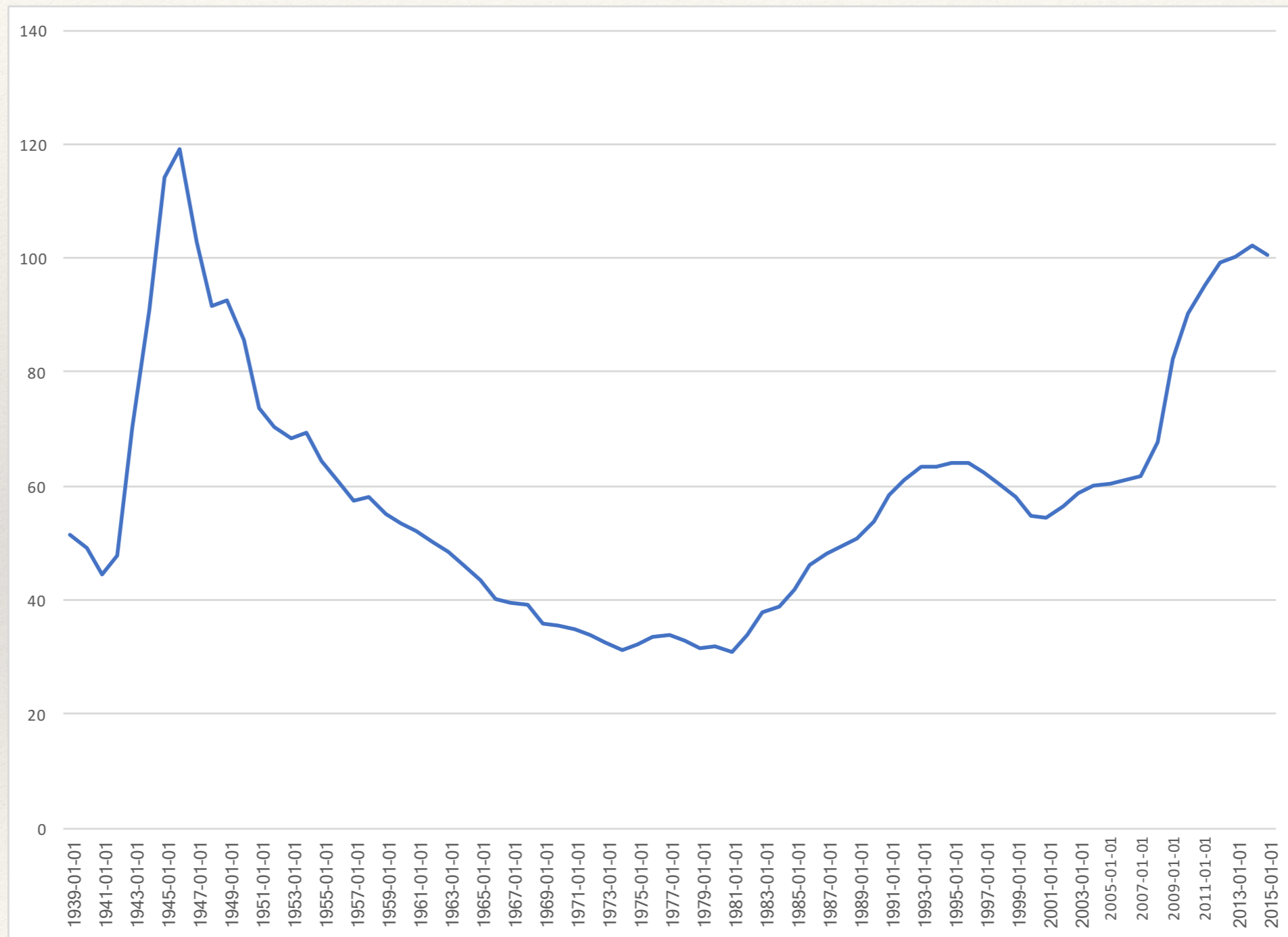
E212 Macroeconomics

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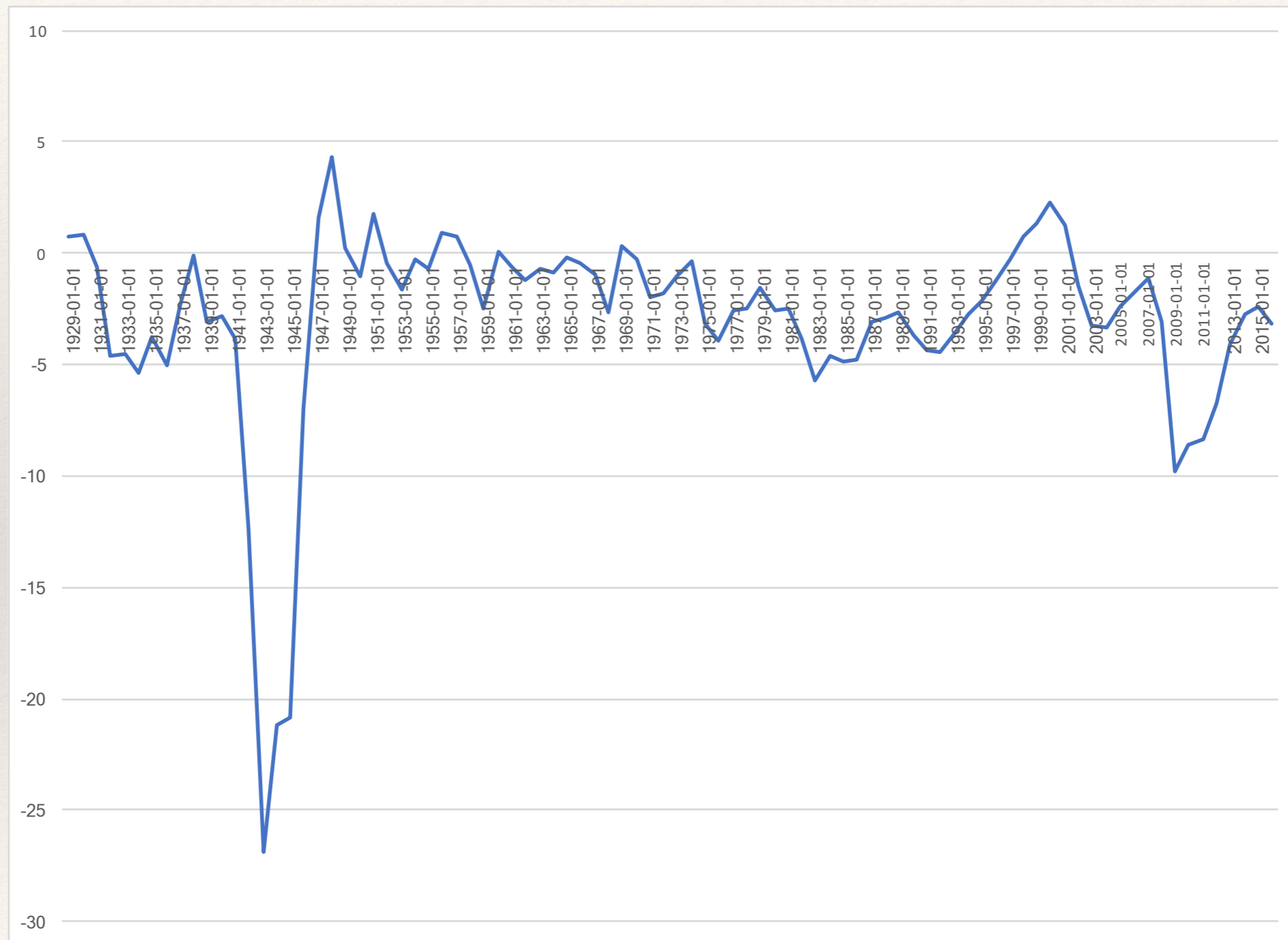
The Role of Fiscal Policy: Government Deficits and Debts

- ❖ Fiscal policy is at the center of current policy discussions. In most advanced economies, the 2007-2009 financial crisis has led to large budget deficits and a large increase in debt-to-GDP ratios.
- ❖ In a number of countries, investors have started worrying about whether debt can indeed be repaid and are asking for higher interest rates to compensate for the risk of default. This calls for governments to strongly reduce deficits, stabilize the debt, and reassure investors.
- ❖ At the same time however, the recovery is weak and a fiscal contraction is likely to slow it down further, at least in the short run.
- ❖ Thus, governments face a difficult choice: Reduce deficits rapidly and reassure markets that they will pay their debt, at the risk of lower growth or even a recession; or reduce deficits more slowly in order to avoid further slowing the recovery, at the risk of not convincing investors that debt will be stabilized.

Gross Federal Debt in the United States (% of GDP)



Federal Surplus (+) or Deficit (-) in the United States (% of GDP)



The Evolution of Public Debt

The budget deficit leads to accumulation of public debt.

$$B_t - B_{t-1} = rB_{t-1} + G_t - T_t$$

The change in real government debt is equal to the budget deficit.

The budget deficit consists of two elements: 1. the *primary deficit* $G-T$, and interest payments on the existing debt, rB .

Current versus Future Taxes

Consider first a one-year decrease in taxes for the path of debt and future taxes. Start from a situation where, until year 1, the government has balanced its budget, so that initial debt is equal to zero. During year 1, the government decreases taxes by 1 (think one billion dollars, for example) for one year. Thus, debt at the end of year 1, B_1 , is equal to 1. The question we take up: What happens thereafter?

Let us first assume full repayment in Year 2

$$B_2 = (1+r)B_1 + G_2 - T_2$$

This means $B_2 = 0$, which implies that,

$$T_2 - G_2 = (1+r)B_1 = (1+r)$$

To repay the debt fully, the government must run a primary surplus equal to $1+r$. It must either decrease primary expenditure or reduce taxes. We shall assume here and in the rest of this section that the adjustment comes through taxes, so that the path of spending is unaffected. It follows that the decrease in taxes by 1 during year 1 must be offset by an increase in taxes by $1+r$ during year 2.

A Temporary Tax Cut followed by Full Repayment of the Resulting Debt in Year N

Full Repayment in Year N

$$B_N = (1+r)^N B_1 + G_N - T_N$$

This means $B_N = 0$, which implies that,

$$T_N - G_N = (1+r)^N B_1 = (1+r)^N$$

To repay the debt fully, the government must run a primary surplus equal to $(1+r)^N$. It must either decrease primary expenditure or reduce taxes.

It follows that a temporary decrease in taxes by 1 during year 1 must be offset by an increase in taxes by $(1+r)^N$ during year N in order to repay the debt that has accumulated in the meantime.

If government spending is unchanged, even a temporary decrease in taxes must eventually be off- set by an increase in taxes in the future. The longer the government waits to increase taxes, or the higher the real interest rate is, the higher the eventual increase in taxes must be.

A Temporary Tax Cut followed by Stabilization of the Resulting Debt in Year N

Debt Stabilization in Year N

$$B_N = (1+r)^N B_1 + G_N - T_N$$

This means B_N is stabilized at its current value and is not repayed. This implies that,

$$T_N - G_N = rB_{N-1} = r[(1+r)^{N-1} B_1]$$

To stabilize the debt, the government must run a primary surplus equal to rB_{N-1} . It must either decrease primary expenditure or reduce taxes.

It follows that the temporary decrease in taxes by 1 during year 1 must be offset by an increase in taxes by $r(1+r)^{N-1}$ during year N .

If government spending is unchanged, a decrease in taxes must eventually be offset by an increase in taxes in the future. The longer the government waits to increase taxes, or the higher the real interest rate is, the higher the eventual increase in taxes must be.

A General Treatment of the Evolution of the Debt to GDP Ratio

Public debt evolves over time according to,

$$B_t = (1 + r)B_{t-1} + G_t - T_t$$

Dividing through by GDP, Y , we get

$$\frac{B_t}{Y_t} = (1 + r) \frac{B_{t-1}}{Y_t} + \frac{G_t - T_t}{Y_t} = (1 + r) \left(\frac{Y_{t-1}}{Y_t} \frac{B_{t-1}}{Y_{t-1}} \right) + \frac{G_t - T_t}{Y_t}$$

Assuming that GDP grows at a rate g

$$\frac{B_t}{Y_t} = \frac{(1 + r) B_{t-1}}{(1 + g) Y_{t-1}} + \frac{G_t - T_t}{Y_t} = (1 + r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

Stabilizing the Debt to GDP Ratio

The change in the debt to GDP ratio evolves according to,

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = (r - g) \frac{B_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t}$$

The increase in the ratio of debt to GDP will be larger:

1. the higher the real interest rate,
2. the lower the growth rate of output,
3. the higher the initial debt ratio,
4. the higher the ratio of the primary deficit to GDP.

To stabilize the debt to GDP ratio at a level b requires a primary surplus equal to,

$$\frac{T_t - G_t}{Y_t} = (r - g)b$$

How Countries Reduced their Debt to GDP Ratios after World War II

After World War II, many countries, including the United States, the United Kingdom and others, had very high debt ratios, often in excess of 100% of GDP. Yet, two or three decades later, the debt ratios were much lower, often below 50%. How did they do it?

There are two, not mutually exclusive, ways in which a country can reduce its debt ratio. The first is through high primary surpluses. Then the decrease in the debt ratio over some period would just be the sum of the ratios of primary surpluses to GDP over the period. The second is through a low r , or through a high g , or a combination of the two.

The decline in debt to GDP ratios in the OECD countries until the early 1980s was not mainly the result of primary surpluses, but the result of sustained high growth and sustained negative real interest rates.

Ricardian Equivalence of Debt and Taxes

How does taking into account the government budget constraint affect the way we should think of the effects of deficits on output?

One extreme view is that once the government budget constraint is taken into account, neither deficits nor debt have an effect on economic activity! This argument is known as the *Ricardian equivalence proposition*. David Ricardo, one of the great classical economists, was the first to articulate its logic. His argument was further developed and given prominence in the 1970s by Robert Barro, then at Chicago, now at Harvard University. For this reason, the argument is also known as the Ricardo-Barro proposition.

Under the Ricardian equivalence proposition, a long sequence of deficits and the associated increase in government debt are no cause for worry. As the government is dissaving, the argument goes, people are saving more in anticipation of the higher taxes to come. The decrease in public saving is offset by an equal increase in private saving. Total saving is therefore unaffected, and so is investment. The economy has the same capital stock today that it would have had if there had been no increase in debt. High debt is no cause for concern.

Most macroeconomists do not entirely adhere to this view, and suggest that budget deficits have an important effect on economic activity. In the short run, larger deficits are likely to lead to higher demand and to higher output. In the long run, higher government debt lowers capital accumulation and, as a result, lowers output.

The Dangers of High Debt

One of the dangers of high debt is the possibility of a debt crisis.

The higher the ratio of debt to GDP, the larger the potential for catastrophic debt dynamics. Even if the fear that the government may not fully repay the debt was initially unfounded, it can easily become self-fulfilling. The increased interest the government must pay on its debt if investors start questioning its ability to service its debt, can lead the government to lose control of its budget and lead to an increase in debt to a level such that the government is unable to repay the debt, thus validating the initial fears.

The lesson appears to be that when a government inherits a high debt ratio, it should aim at decreasing it over time.

The US Budget Deficit Challenge

So far, investors do not appear worried about U.S. budget deficits. Even long-term interest rates on U.S. government bonds are very low. Nevertheless, it is clear that first stabilizing and then decreasing the U.S. debt ratio will require major adjustments in fiscal policy.

Looking at the medium run, the fiscal situation looks bad. And even more serious challenges arise in the longer run.

The numbers are striking: Under current rules, Social Security benefits are projected to increase from 4.8% of GDP in 2011 to 5.9% in 2050. Medicare and Medicaid benefits are projected to increase from 5.6% to 11.8%. The ratio of entitlement spending to GDP (the sum of the two numbers) is projected therefore to increase by 7.3% of GDP over the next 40 years. These projected increases have two main sources:

- The first is the aging of America, the rapid increase in the proportion of people over 65 that will take place as the Baby Boom generation begins to reach retirement age, from year 2011 on. The old age dependency ratio—the ratio of the population 65 years old or more to the population between 20 and 64 years—is projected to increase from about 20% in 2000 to above 40% in 2050. This evolution explains the projected growth in Social Security benefits and some of the increase in Medicare.
- The second, which explains the rest of the growth of Medicare and all the growth in Medicaid, is the steadily and rapidly increasing cost of health care.

Can these increases in entitlement spending be offset by decreases in other government expenditures? The answer is a clear no. Even if all expenditures other than transfers were eliminated, there would still not be enough to cover the projected increase in entitlement spending: In 2010, total government expenditures, excluding interest payments and transfers, were equal to 7.9% of GDP, about the same as the 7.3% projected increase in entitlement spending.

It is therefore clear that major changes in entitlement programs will have to take place. Social Security benefits may have to be reduced (relative to projections), and the provision of medical care will have to be limited (again, relative to projections). There is also little doubt that taxes, such as the payroll taxes used to finance Social Security, will have to be increased. If such changes are not achieved, there will be good reasons to worry about U.S. debt dynamics.