

INTERMEDIATE MACROECONOMICS-II

B.A.(H) Economics, Semester-IV

Topic-3: Fiscal & Monetary Policy

Reference: Blanchard, Macroeconomics (5th ed.)

CHAPTER 26: Fiscal Policy: A Summing Up

Lecture Notes

Shri Ram College of Commerce

2019-20

Fiscal Policy: A summing Up

- In the short run, a budget deficit increases demand and output.
- In the medium run, output returns to the natural level of output. The interest rate is higher, and investment spending is lower.
- In the long run, lower investment will lead to a lower level of capital stock and, therefore, a lower level of output.
- While deriving these conclusions, we tend to overlook the government budget constraint.
- Government budget constraint involves the relation between debts, deficits, government spending, and taxes.

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- Government budget constraint involves the relation between debts, deficits, government spending, and taxes.

The Government Budget Constraint

The Arithmetic of Deficits and Debt

- The budget deficit in year t is represented as:

$$\text{deficit}_t = rB_{t-1} + G_t - T_t$$

- B_{t-1} represent the government debt at the end of year, $t - 1$ or, equivalently, at the beginning of year t .
- r is the real interest rate, which we shall assume to be constant here. Thus rB_{t-1} equals the real interest payments on the government debt in year t .
- G_t is government spending during year t . T_t is taxes minus transfers during year t .
- Thus, the budget deficit equals spending, including interest payments on the debt, minus taxes net of transfers.

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- Interest payments here are measured as real interest payments (i.e. real interest rate times existing debt) rather than as actual interest payments (i.e. nominal interest rate times existing debt).
- The correct measure of the deficit (which incorporates real interest payments and hence inflation) is also referred to as the inflation-adjusted deficit.
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- The government budget constraint then states that the change in government debt during year t is equal to the deficit during year t :

$$B_t - B_{t-1} = \text{deficit}_t$$

- If government runs a deficit, government debt increases. If government runs a surplus, government debt decreases.
- Substituting this in the definition of deficit, the government budget constraint becomes:

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

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- Deficit can be decomposed broadly into the sum of two terms:
 - (1) Interest payments, rB_{t-1}
 - (2) The difference between spending and taxes, $G_t - T_t$ which is also referred to as the primary deficit¹.
- Rewriting government budget constraint as:

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

- This suggests that debt at the end of year t equals $(1 + r)$ times debt at the end of year $t - 1$, plus the primary deficit during year t , $(G_t - T_t)$.

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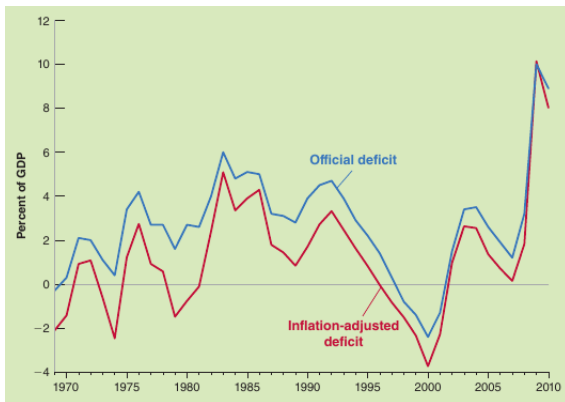
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The following graph plots the official measure and the inflation-adjusted measure of the (federal) budget deficit for the United States since 1969. The official measure shows a deficit in every year from 1970 to 1997. The inflation-adjusted measure shows instead alternating deficits and surpluses until the late 1970s.



Current v/s Future Taxes

- In this section, we'll look at the implications of a 1-year decrease in taxes for the path of debt and future taxes.
- We 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.
- Therefore, debt at the end of year 1, B_1 , is equal to 1.

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Full Repayment in Year-2

- Given $B_1 = 1$, suppose the government decides to fully repay the debt during year-2 i.e. $B_2 = 0$. The budget constraint for Year-2, then gives,

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

- This suggests, in order to repay the debt fully in year-2, the government must run a primary surplus equal to $(1 + r)$. It can do so in one of two ways: a decrease in spending or an increase in taxes.
- We 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.

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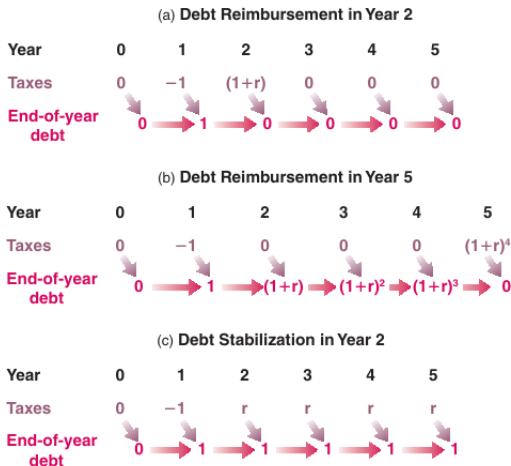
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The following figure represents the path of taxes and debt.

Figure 23-1

Tax Cuts, Debt Repayment, and Debt Stabilization

(a): If the debt is fully repaid during year 2, the decrease in taxes of 1 in year 1 requires an increase in taxes equal to $(1 + r)$ in year 2. (b): If the debt is fully repaid during year 5, the decrease in taxes of 1 in year 1 requires an increase in taxes equal to $(1 + r)^4$ during year 5. (c): If the debt is stabilized from year 2 on, then taxes must be permanently higher by r from year 2 on.



Full Repayment in Year t

- If the government decides to wait until year t to repay the debt. So, from year-2 to year $- t - 1$, the primary deficit is equal to zero—taxes are equal to spending, not including interest payments on the debt.
- During year-2, the primary deficit is zero i.e. $(G_2 - T_2) = 0$.
Therefore, debt at the end of year-2 will be,

$$B_2 = (1 + r)B_1 + 0 = (1 + r)1 = (1 + r)$$

- Similarly, the primary deficit is still zero during year-3, debt at the end of year-3 will be,

$$B_3 = (1 + r)B_2 = (1 + r)^2$$

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- So as long as the government keeps a primary deficit equal to zero, debt grows at a rate equal to the interest rate, and thus debt at the end of year $t - 1$ is given by,

$$B_{t-1} = (1 + r)^{t-2}$$

- Despite the fact that taxes are cut only in year 1, debt keeps increasing over time, at a rate equal to the interest rate.
- This is because with the primary deficit being zero, debt is positive, and so are interest payments on the debt. Each year, the government must issue more debt to pay the interest on existing debt.
- In year t , the year in which the government decides to repay the debt, the budget constraint is

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Debt Stabilization in Year t

- What happens to taxes if the government instead of paying back debt in full, rather only stabilizes the debt².
- Suppose the government decides to stabilize the debt from year-2 on. Stabilizing the debt from year-2 on means the debt at the end of year-2 and thereafter remains at the same level as it was at the end of year-1.
- The budget constraint for year-2 is:

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

- Under our assumption that debt is stabilized in year-2, $B_2 = B_1 = 1$. This gives:

$$\begin{aligned} 1 &= (1 + r) + (G_2 - T_2) \\ \Rightarrow T_2 - G_2 &= (1 + r) - 1 = r \end{aligned}$$

²Stabilizing the debt means changing taxes or spending so that debt remains constant from then on.

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- Therefore, to avoid a further increase in debt during year-1, the government must run a primary surplus equal to real interest payments on the existing debt.
- The government must do so in each of the following years as well: Each year, the primary surplus must be sufficient to cover interest payments, leaving the debt level unchanged.
- Whenever the government stabilizes debt, it must from then on run a primary surplus sufficient to pay the interest on the debt.
- From this we can conclude,
 - (1) The legacy of past deficits is higher government debt.
 - (2) To stabilize the debt, the government must eliminate the deficit.
 - (3) To eliminate the deficit, the government must run a primary surplus equal to the interest payments on the existing debt. This requires higher taxes forever.

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The Evolution of the Debt-to-GDP Ratio

- In an economy along with the evolution of debts, output also increases overtime. Therefore, to estimate the situation better, analyzing the ratio of *debt to output* can give better estimates.
- To get the ratio of *debt-to-output*, first divide the budget constraint in period t with respect to output in that period.

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

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

- Let rate of growth of output is represented by g , so Y_{t-1}/Y_t can be written as $1/(1 + g)$. And using an approximation,

$$\frac{(1 + r)}{1 + g} \approx (1 + r - g)$$

- Using these two assumptions, rewrite the preceding equation as

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

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

- Note, the change in the debt ratio over time is equal to the sum of two terms:
 - (1) The first term is the difference between the real interest rate and the growth rate times the initial debt ratio.
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- This equation implies that 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.

The Evolution of the Debt Ratio in OECD Countries

- 1960s: Period of strong growth such that average growth exceeded the average real interest rate in most countries. As a result, $(r - g)$ was negative, and most countries were able to decrease their debt-to-gdp ratios without running primary surpluses.
- 1970s: Lower growth, but very low real interest rates (nominal rates were high but expected inflation was high as well). Thus $(r - g)$ was negative, therefore, a further decrease in debt ratio.
- 1980s: Real interest rates increased along with fall in growth rates. OECD countries didn't run high primary surpluses, and their debt ratio increased.
- 1990s: Real interest rates were high along with low growth rates. Most OECD countries maintained high primary surpluses and hence managed to decrease their debt ratios.

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Four Issues in Fiscal Policy

Ricardian Equivalence

- The Ricardian Equivalence, further developed by Robert Barro, and also known as the Ricardo-Barro proposition, is the argument that, once the government budget constraint is taken into account, neither deficit nor debt has an effect on economic activity.
- Consumers do not change their consumption in response to a tax cut if the present value of after-tax labor income is unaffected. The effect of lower taxes today is canceled out by higher taxes tomorrow.
- Therefore, if a government finances a given path of spending through deficits, private savings will increase one for one with decrease in public savings, leaving total savings unchanged.

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Deficits, Output Stabilization, and the Cyclically Adjusted Deficit

- The fact that budget deficits have adverse effects implies that deficits during recessions should be offset by surpluses during booms.
- The deficit that exists when output is at the natural level of output³ is called the **full-employment deficit**. This is also at times referred to as **midcycle deficit**, **standardized employment deficit**, **structural deficit**, or **cyclically adjusted deficit**.
- This measure gives a benchmark to analyze the direction of fiscal policy.

³Natural level of output is the output level that would be produced if the economy were operating at the natural rate of unemployment.

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- If actual budget deficit is larger but cyclically adjusted deficit is zero, then current fiscal policy is consistent with no systematic increase in debt over time. The debt will increase as long as output is below the natural level of output; but as output returns to its natural level, the deficit will disappear and the debt will stabilize.
- Construction of measures of the cyclically adjusted deficit requires two steps, first, establish how much lower the deficit would be if output were, say, 1% higher. Second, assess how far output is from its natural level:

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- A rule of thumb is that, in USA, a 1% decrease in output leads to an increase in the deficit of 0.4% of GDP. This increase occurs because most taxes are proportional to output, whereas most government spending does not depend on the level of output. That means a decrease in output, leads to a decrease in revenues and not much change in spending, naturally leads to a larger deficit.
- If output is, say 5% below its natural level, the deficit as a ratio of GDP will, therefore, be about 2.5% larger than it would be if output was at the natural level of output. This effect of the deficit on economic activity has been called the **automatic stabilizer**. A recession naturally generates a deficit, and therefore a fiscal expansion, which partly counteracts the recession.

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- Difficulty with the second step is based on the estimate of natural level of output. As low estimate of the natural rate of unemployment will lead to high estimates of the natural level of output and therefore too optimistic a measure of the cyclically adjusted deficit.

Wars and Deficits

- The economic burden of war affects consumers and firms differently depending on how the war is paid for.
- There are two good reasons to run deficits during wars:
 - (1) The first is distributional—Deficit finance is a way to pass some of the burden of the war to those alive after the war, and it seems only fair for future generations to share in the sacrifices the war requires.
 - (2) The second is more narrowly economic—Deficit spending helps reduce tax distortions.

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Passing on the Burden of the War

- Wars lead to large increases in government spending.
 - (1) Suppose the government relies on deficit finance. With government spending sharply up, there will be a very large increase in the demand for goods.
 - (2) Suppose instead that the government finances the spending increase through an increase in taxes. Consumption will decline sharply.

Reducing Tax Distortions

- Very high tax rates can lead to very high economic distortions. People will work less, and engage in illegal, untaxed activities.
- Tax smoothing is the idea that it is better to maintain a relatively constant tax rate, to smooth taxes.
- Tax smoothing implies large deficits when government spending is high and small surpluses for the rest of the time.

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The Dangers of Very High Debt

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

- The higher the ratio of debt to GDP, the larger the potential for catastrophic debt dynamics.
- Expectations of higher and higher debt give a hint that a problem may arise, which will lead to the emergence of the problem, thereby validating the initial expectations.
- **Debt repudiation** consists of canceling the debt, in part or in full. This allows for a decrease in taxes and thus a decrease in distortions. Thereby, it can decrease the risk of vicious cycles.

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The U.S. Budget: Current Numbers and Future Prospects

Current Numbers

- There are many different definitions of “expenditures”, “revenues”, and “deficit”.
- Some numbers refer to the budget of the federal government. Some numbers consolidate the accounts of the federal, state, and local governments.
- One set of numbers is based on the government accounting system; another set of numbers is based on the national income accounting system.
- The national income and product accounts (NIPA) use a different accounting system. That system provides a more economically meaningful set of budget numbers.

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Current Numbers

The main differences between the government numbers and the NIPA numbers are:

- The government budget numbers are presented by fiscal year (from 1st October to 31st September), whereas NIPA numbers are reported for the calendar year.
- The government budget numbers are presented in two categories: “on-budget” and “off-budget”. NIPA measures make no such distinction.
- The two accounting systems differ in how they treat the sale of government assets. Government account treats asset values as revenues, whereas NIPA doesn't include them.
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Current Numbers

- The difference between the official and the NIPA measures of the deficit can be positive or negative.
- We encounter two numbers for (federal) government debt:
 - (1) One is gross debt, the sum of the federal government's financial liabilities.
 - (2) The other, more relevant number is net debt, or equivalently, debt held by the public.

The U.S. Budget: Current Numbers and Future Prospects

The following graph presents the basic budget numbers for fiscal year 2006, using NIPA numbers.

**Table 26-2 U.S. Federal Budget Revenues and Expenditures, Fiscal Year 2006
(Percent of GDP)**

Revenues	18.9		
Personal taxes		7.9	
Corporate profit taxes		2.9	
Indirect taxes		0.8	
Social insurance contribution		6.8	
Other		1.3	
Expenditures, excluding interest payments	18.4		
Consumption expenditures		6.1	
Defense			4.1
Nondefense			2.0
Transfers		8.9	
Grants to state/local governments		2.8	
Other		0.7	
Primary surplus (1) (+ sign: surplus)	0.5		
Net interest payments (2)	2.2		
Real interest payments (3)		0.8	
Inflation component		1.4	
Official surplus: (1) minus (2)	-1.7		
Inflation adjusted surplus: (1) minus (3)	-0.3		
Memo item. Debt-to-GDP ratio	37.0		