ECON 202 Intermediate Macroeconomics: Fiscal Policy Lec 26

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Overview of Lecture

i. Readings: Only Lecture Slides.
ii. Basics of Fiscal Policy
iii. Government Budget Constraint (GBC), Government Intertemporal Budget Constraint (GIBC) and Solvency.
iv. Ricardian Equivalence

Role of Government

i. The government plays an important role in modern economies by purchasing a significant fraction of output in the course of providing public goods and services such as education and health care.

ii. They also redistribute income across and within generations

iii. **Stabilization Policy:** many economists believe that fiscal policy can and should be used to lessen the severity of short-term business cycles.

iv. Fiscal policy can also affect long term economic growth.

Government Expenditure and Finance

i. Major components of government expenditure:
   - Government spending on goods and services.
   - Transfer payments.
   - Interest payments on borrowed funds.

ii. How do governments raise resources to finance this spending?
   - Collecting taxes from households and businesses.
   - Printing money: seigniorage income.
   - Borrowing from domestic private sector or from abroad.

Budget Deficits and Real Net Debt

i. The **budget deficit**: the difference between government expenditure and tax revenue in a particular period.

ii. Budget deficits adds to the government's net liabilities (liabilities minus assets), which we call *net government debt*.

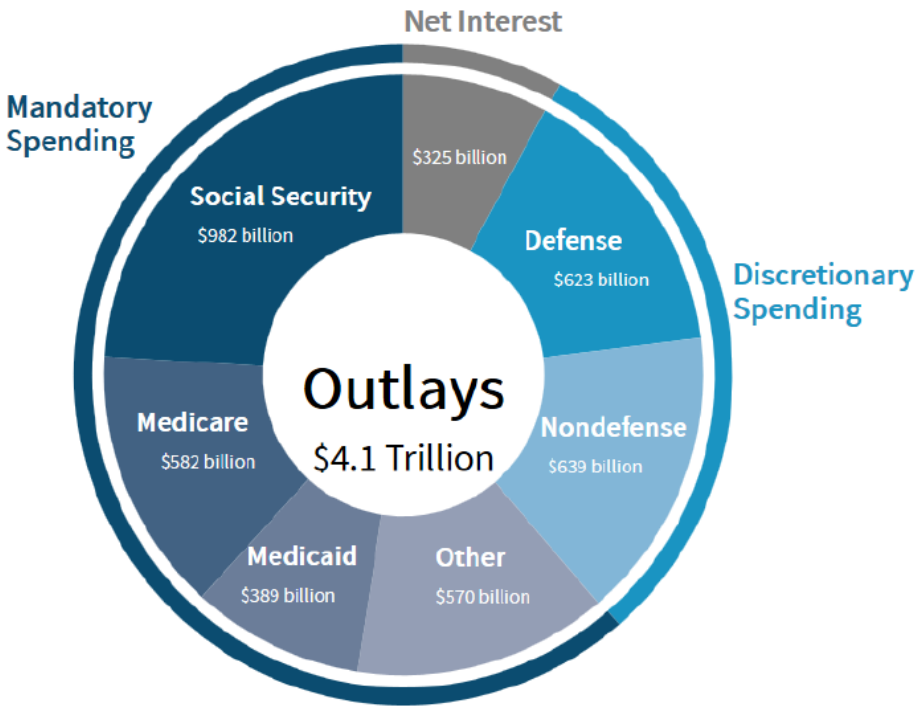
iii. The evolution of real net debt is given by:

$$B_{t+1} = B_t + D_t \tag{1}$$

iv. B_t refers to stock of real net government debt at beginning of period t and D_t refers to real budget deficit in period t (inflation adjusted).

US Government Expenditure Breakdown

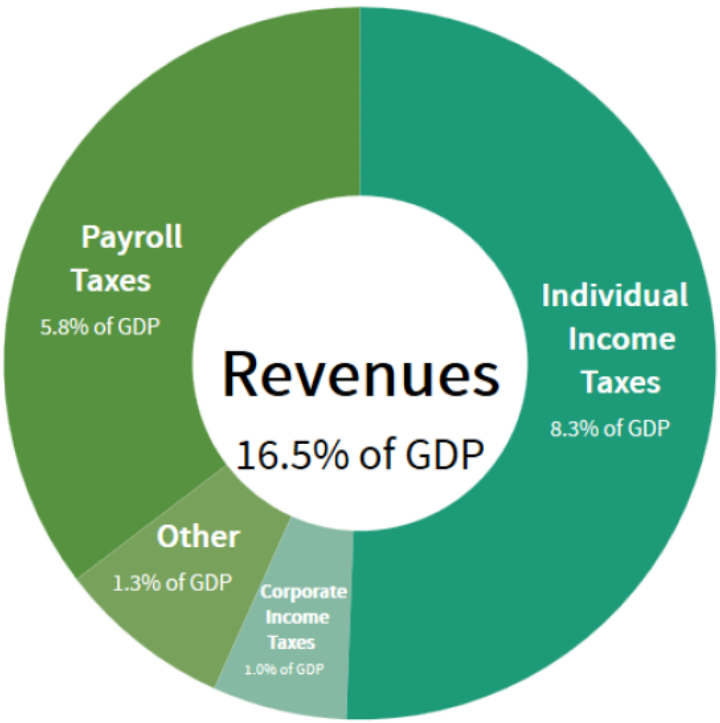
U.S. Federal Government Expenditure for Fiscal Year 2018



Source: Congressional Budget Office

US Government Revenue

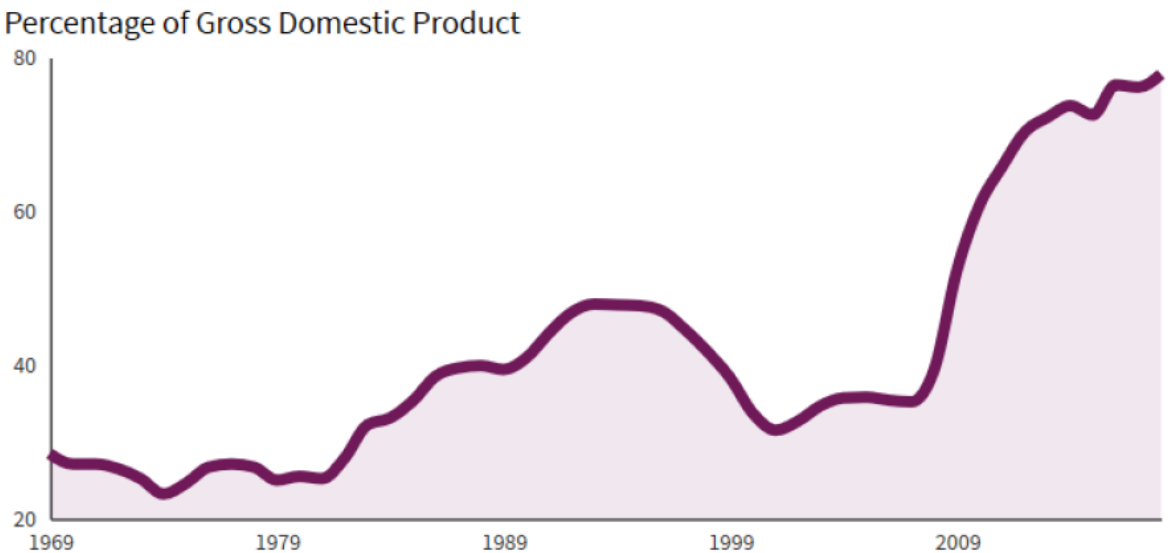
U.S. Federal Government Revenue for Fiscal Year 2018



Source: Congressional Budget Office

US Federal Debt Evolution

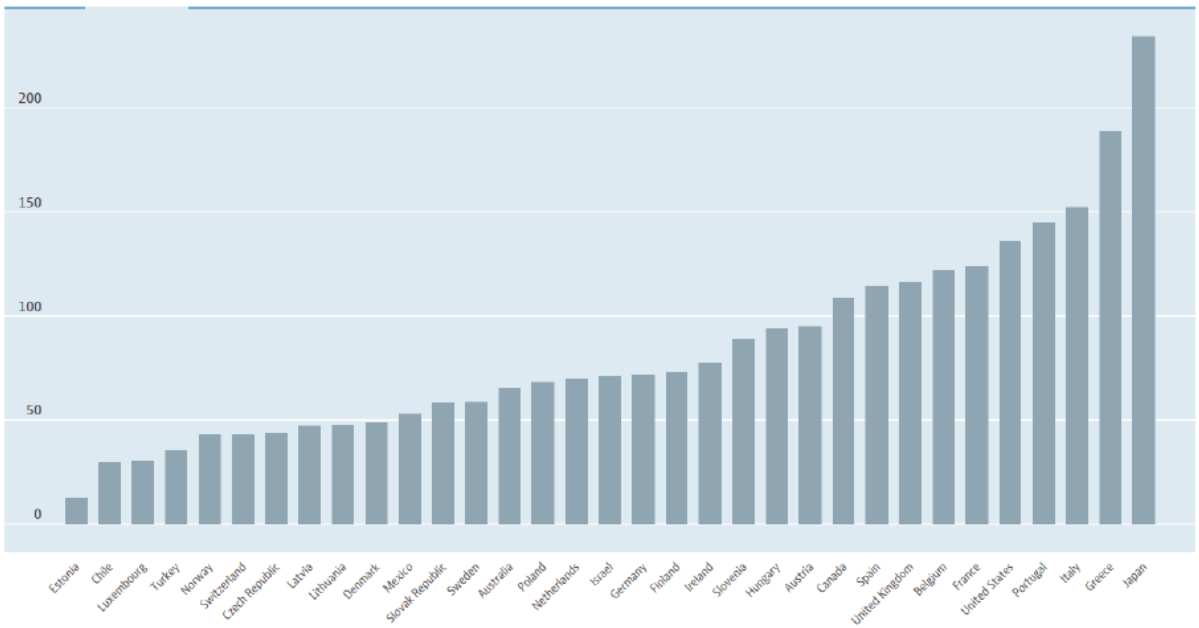
U.S. Federal Debt held by the Public



Source: Congressional Budget Office

Government Debt for OECD Economies

General Government Debt 2017
OECD countries, % of GDP



Source: Organization for Economic Cooperation and Development

Government's Budget Constraint

i. Government's budget constraint (GBC) for a given period is given by: $G_t + r_t B_t = T_t + D_t$

ii. G_t: government spending on goods and services in period t

iii. $r_t B_t$: interest payments on the government debt outstanding in period t

iv. $G_t + r_t B_t$: total government expenditures in period t

v. T_t: net tax receipts (tax receipts less transfer payments) in period t

vi. D_t: budget deficit (budget surplus if negative) in period t

Rewriting the Government's Budget Constraint

i. From (1), $D_t = B_{t+1} - B_t$ so the GBC can be written as:

$$G_t + r_t B_t = T_t + B_{t+1} - B_t \tag{2}$$

or equivalently:

$$G_t + (1 + r_t) B_t = T_t + B_{t+1}, \forall t \tag{3}$$

, which is also equivalent to:

$$B_{t+1} = (1 + r_t) B_t + G_t - T_t \tag{4}$$

ii. $G_t - T_t$ is called the **primary deficit**. The three equations (2-4) above are variations of the periodic/flow budget constraint.

Government Solvency and GIBC

i. Can the government permanently avoid levying taxes, simply by borrowing more to finance its expenditures?

ii. Implications of ongoing primary deficits:

iii. If the government were to keep borrowing, the amount of government borrowing eventually would exceed real wealth in the economy

iv. Governments, face a budget constraint that limits the amount that they can spend over time.

v. This can be more clearly seen from the government's **intertemporal budget constraint (GIBC)** derived in upcoming slides.

Government Solvency and the GIBC

i. Let $R_t = 1 + r_t$ and rewrite equation (3) as: $G_t + R_t B_t = T_t + B_{t+1}$.

ii. Divide both sides by R_t to get:

$$B_t + \frac{G_t}{R_t} = \frac{T_t}{R_t} + \frac{B_{t+1}}{R_t} \tag{5}$$

iii. The period $t+1$ GBC is: $G_{t+1} + R_{t+1} B_{t+1} = T_{t+1} + B_{t+2}$.

iv. Replacing B_{t+1} by (4) and dividing throughout by $R_{t+1} R_t$ and rearranging gives:

$$B_t + \frac{G_t}{R_t} + \frac{G_{t+1}}{R_{t+1} R_t} = \frac{T_t}{R_t} + \frac{T_{t+1}}{R_{t+1} R_t} + \frac{B_{t+2}}{R_{t+1} R_t} \tag{6}$$

Government Solvency and the GIBC

i. Similarly, we can use period $t+2$ GBC and $t+1$ GBC to obtain:

$$\begin{aligned} & B_t + \frac{G_t}{R_t} + \frac{G_{t+1}}{R_{t+1}R_t} + \frac{G_{t+2}}{R_tR_{t+1}R_{t+2}} \\ =& \frac{T_t}{R_t} + .. + \frac{T_{t+2}}{R_tR_{t+1}R_{t+2}} + \frac{B_{t+3}}{R_tR_{t+1}R_{t+2}} \end{aligned} \tag{7}$$

ii. Iterating forward, we get:

$$\begin{aligned} & B_t + \frac{G_t}{R_t} + \frac{G_{t+1}}{R_{t+1}R_t} + \frac{G_{t+2}}{R_tR_{t+1}R_{t+2}} + ... \\ =& \frac{T_t}{R_t} + .. + \frac{T_{t+2}}{R_tR_{t+1}R_{t+2}} + ... + \lim_{s\to\infty} \frac{B_{t+s}}{R_tR_{t+1}R_{t+2}R_{t+3}....R_{t+s-1}} \end{aligned} \tag{8}$$

Government Solvency and the GIBC

i. GIBC requires that $\lim_{s\to\infty} \frac{B_{t+s}}{\prod_{i=1}^{s} R_{t+i-1}} = 0$ so that:

$$B_t + \frac{G_t}{R_t} + \frac{G_{t+1}}{R_{t+1}R_t} + \frac{G_{t+2}}{R_tR_{t+1}R_{t+2}} + ... = \frac{T_t}{R_t} + \frac{T_{t+1}}{R_tR_{t+1}} + \frac{T_{t+2}}{R_tR_{t+1}R_{t+2}} + ... \quad (9)$$

ii. The GIBC requires that the government collects, over time, net taxes that are large enough, in present value, to cover the present value of spending as well as initial debt.

iii. The GIBC can alternatively be written as:
$B_t = \frac{T_t - G_t}{R_t} + \frac{T_{t+1} - G_{t+1}}{R_tR_{t+1}} + \frac{T_{t+2} - G_{t+2}}{R_tR_{t+1}R_{t+2}} + ...$

iv. The $T_t - G_t$ terms are the primary surpluses in every period.

Ricardian Equivalence Theorem

i. This theorem states that a change in the timing of taxes by the government is neutral.

ii. By neutral, we mean that in equilibrium a change in current taxes, exactly offset in present-value terms by an equal and opposite change in future taxes, has no effect on the real interest rate or on the consumption of individual consumers.

iii. There is a sense in which government deficits do not matter, which seems to run counter to standard intuition.

iv. A tax cut is not a *free lunch*.

Ricardian Equivalence: Simple Proof

i. Consider the simple two period government budget constraint with only taxes and government expenditure:

ii. $G_t + \frac{G_{t+1}}{1+r_{t+1}} = T_t + \frac{T_{t+1}}{1+r_{t+1}}$.

iii. Meanwhile, with a sequence of lump sum taxes (T_t, T_{t+1}), the household's lifetime constraint in the two period model is: $C_t + \frac{C_{t+1}}{1+r_{t+1}} = Y_t + \frac{Y_{t+1}}{1+r_{t+1}} - \left(T_t + \frac{T_{t+1}}{1+r_{t+1}}\right)$.

iv. Consider an experiment in which the timing of taxes changes in such a way that the government budget constraint continues to hold at r_{t+1}. That is, current taxes change by ΔT for each consumer, with future taxes changing by $\frac{-\Delta T}{1+r_{t+1}}$.

Ricardian Equivalence: Simple Proof

i. Under this change in tax timing, the RHS of consumers' constraint becomes $Y_t + \frac{Y_{t+1}}{1+r_{t+1}} - \left(T_t + \Delta T + \frac{T_{t+1} - \frac{\Delta T}{1+r_{t+1}}}{1+r_{t+1}} \right)$.

ii. ΔT cancels with $\frac{\Delta T}{1+r_{t+1}} (1 + r_{t+1})$ so that the RHS which is the lifetime wealth is invariant to this change in tax timing.

iii. Thus, the household's budget constraint is unaltered by such a change in tax timing and hence, the household consumption is invariant to tax timing. This is called **Ricardian Equivalence**.

Thank you