Government Budget and its Economic Impacts

Chapter 8

In this Chapter:

- Public Deficit and Debt.
- The importance of credibility and commitment of public authorities.
- Rationality and how it affects the performance of fiscal policy.
- The economic effects of public budget decisions.
- How to get out of hyperinflation.
- Fiscal multipliers, crowding out and in.
- Austerity or profligacy?

The Nature of Government Budgets

Contrary to what many people think, government budgets are vastly different from the budget of households.

How?

- Governments have a monetary institution that can print money.
- Governments do not retire (like individuals).
- Ratio do GDP more important than absolute value of Debt.

The Nature of Government Budgets

Government budgets, its trajectory, and the need to finance it are completely distinct from the budget of a typical household.

Analyzing public deficit, debt, and their impacts on society are more complex than they seem at first glance.

Government Bonds: What are they?

Government bonds are the way that governments finance themselves when they want to spend more than their revenue.

E.g.: Assume a government that raises USD 1 trillion in taxes wants to spend USD 1.2 trillion on paying its employees, providing public services, and a myriad of other subsidies and transfers. Public authorities have two options:

1) Printing Money
2) Issuing debt in the form of government bonds

Government Bonds

In the more responsible option, the government issues debt. Unlike families, governments can choose to roll over its debt perpetually, without ever being debt free (as long as it maintain credibility).

What matters to the credibility of policymakers: As long as the level of debt is manageable (i.e. society does not believe it will grow uncontrollably), governments do not necessarily need to balance their books.

Comparison between households and governments

Like households, government debt is a problem if it is large relative to income.

Similar to households, debt is a problem to governments if it is growing without a cap.

Government Debt and Current Public Deficit

Current public deficit is the main fuel of debt, which also grows because of the interest rate.

Public deficit is defined as the difference between tax revenue and government expenditure: **PB = G –T** .

- PB: Primary budget
- G: current expenditure
- T: Revenue from taxes

Total Budget

The total budget (TB) also considers interest from past debt. If the interest rate is *r* and total debt is *D*, then total budget is:

TB = PB –rD

United States Deficit Trajectory

Fiscal Year	In Current Dollars			In Constant Dollars			As Percentages of GDP		
	Receipts	Outlays	Deficit	Receipts	Outlays	Deficit	Receip	Outla	Deficit
2010	2,162.7	3,457.1	-1,294.4	2,129.3	3,403.6	-1,274.4	14.6	23.4	-8.7
2011	2,303.5	3,603.1	-1,299.6	2,215.9	3,466.1	-1,250.2	15.0	23.4	-8.5
2012	2,450.0	3,537.0	-1,087.0	2,310.7	3,335.8	-1,025.1	15.3	22.1	-6.8
2013	2,775.1	3,454.6	-679.5	2,583.4	3,216.0	-632.6	16.8	20.9	-4.1
2014	3,021.5	3,506.1	-484.6	2,771.5	3,216.0	-444.5	17.6	20.4	-2.8
2015	3,249.9	3,688.3	-438.4	2,939.5	3,336.0	-396.5	18.3	20.7	-2.5
2016	3,335.5	3,951.3	-615.8	2,960.2	3,506.7	-546.5	18.1	21.4	-3.3
2017	3,643.7	4,147.2	-503.5	3,168.7	3,606.6	-437.8	18.9	21.5	-2.6
2018	3,898.6	4,352.2	-453.6	3,319.4	3,705.6	-386.2	19.4	21.6	-2.3
2019	4,095.1	4,644.3	-549.3	3,411.1	3,868.6	-457.5	19.5	22.1	-2.6
2020	4,345.7	4,879.8	-534.1	3,540.3	3,975.4	-435.1	19.8	22.3	-2.4
2021	4,572.0	5,124.2	-552.3	3,642.7	4,082.7	-440.0	20.0	22.4	-2.4

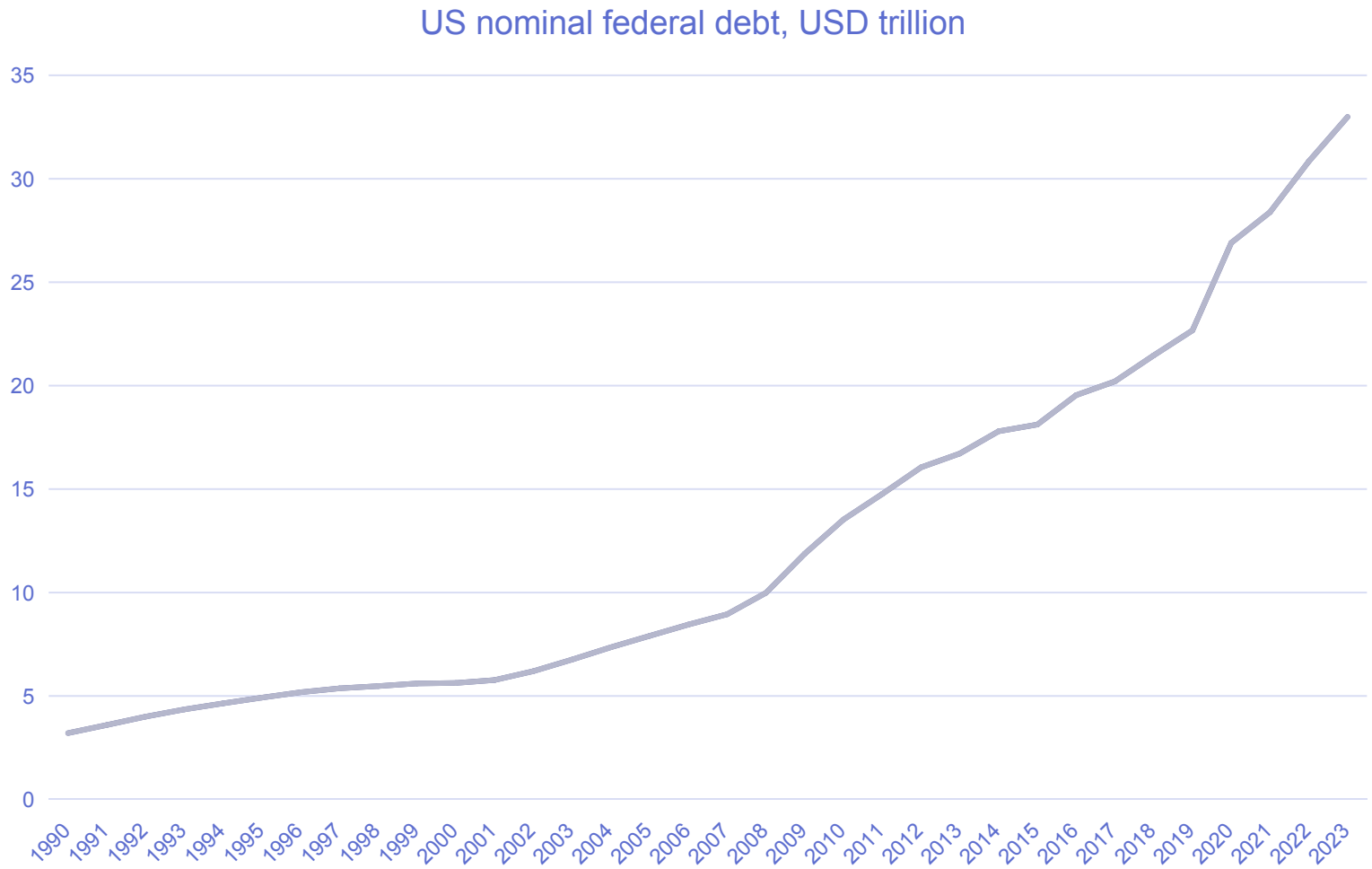
Government Debt and Deficit

Rather than printing money, which drives countries to hyperinflation, government issue more debt to finance their debt, and their total debt increases.

In the case of the US, for the period of 2010–2021, for every single year the federal government had or is expected to run a primary deficit, topping out at –8.7% of GDP in 2010 and declining afterwards. The White House projected a shortfall of 2.5% of GDP in the 2018–2021 period.

The United States Federal Debt

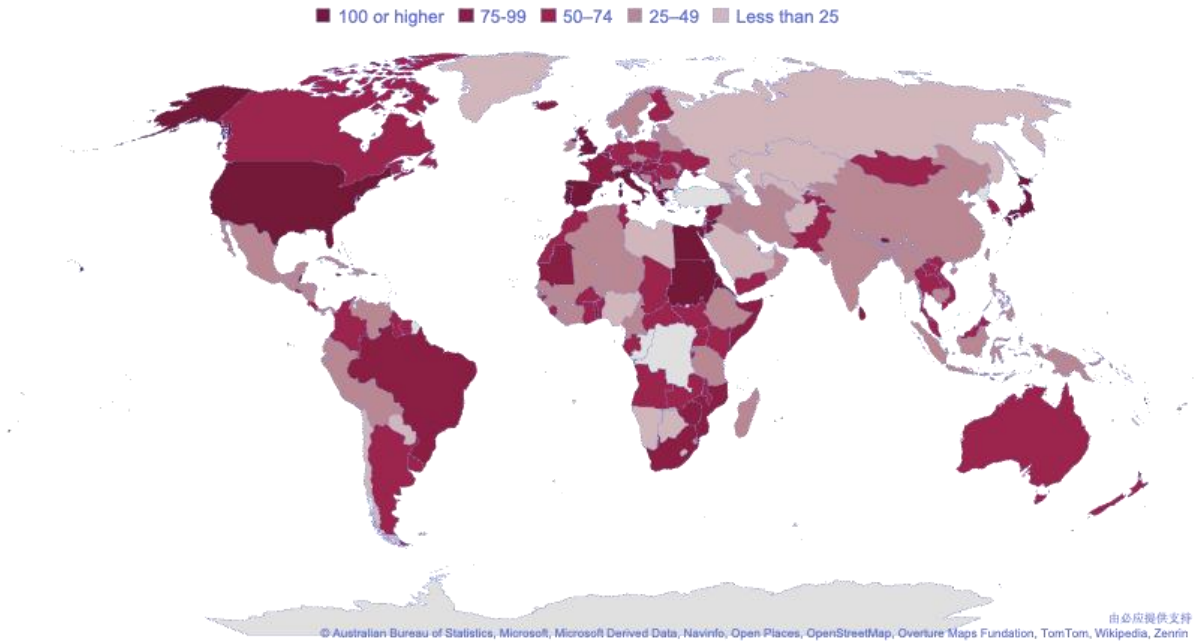
From 1990–2017, US federal debt rose from USD 3.2 trillion to USD 20.5 Trillion, a rate of 7.2% per year. In the same period, GDP increased from USD 5.9 trillion to USD 17.8 trillion.



Source: Fed St Louis (2024)

The Nature of Public Debt

In the mid-2010s total federal debt in the US exceeded the country's entire GDP. High levels of debt to GDP are common among developed countries, but what are the economic implications?



Source: CIA (2024)

Chapter 8.1

Public budget and social welfare

Role of Government Budget on Market for Goods and Services

Decisions on taxes and expenditure impact growth and inflation through changes in aggregate demand.

The public budget affects aggregate demand in two ways: taxes and expenditures. They change disposable income (if it is levied on consumers) or investment (if imposed on businesses). Government expenditure (G) is a direct contributor to aggregate demand. Higher expenditure, such as public investment on infrastructure, increases demand. Conversely, lower expenditure reduces demand.

Role of Government Budget on Market for Goods and Services

In terms of comparative statics, there is no difference between private and public investment as a growth driver. Since: $Y = C + I + G$, both $\uparrow G$ and $\uparrow I$ result in $\uparrow Y$.

The same is true in relation to personal or corporate taxes. Lowering taxes stokes aggregate demand and higher taxes shrink it. This is easy to see if: $C = a+b(Y-T)$. Lower T increases disposable income $(Y-T)$ and hence higher consumption $(\uparrow C)$ leads to increased aggregate demand $(\uparrow Y)$

Role of Government Budget on Market for Goods and Services

Governments can also affect aggregate demand through subsidies and income transfers. More subsidies or transfers to consumers or companies should increase demand.

However, increased government expenditure has consequences. Therefore, the story in the real world does not end at the simple relationship between G and Y.

Chapter 8.2

Public debt and credibility: crowding out and crowding in

Crowding Out vs. Crowding In

Crowding out happens when government expenditure displaces private investment, either through the market for loanable funds or, more directly, in microeconomic markets.

Crowding in is the opposite, and it depends on complementarity decisions made by policymakers and companies.

How does Crowding Out happen?

- Governments need to borrow so they can spend, and they may borrow responsibly or not.
- Reckless borrowing for useless projects generates few economic benefits and instead creates a burden that may restrict future spending.
- Companies have less funds to borrow, since the government has used them, and public investment displace private.

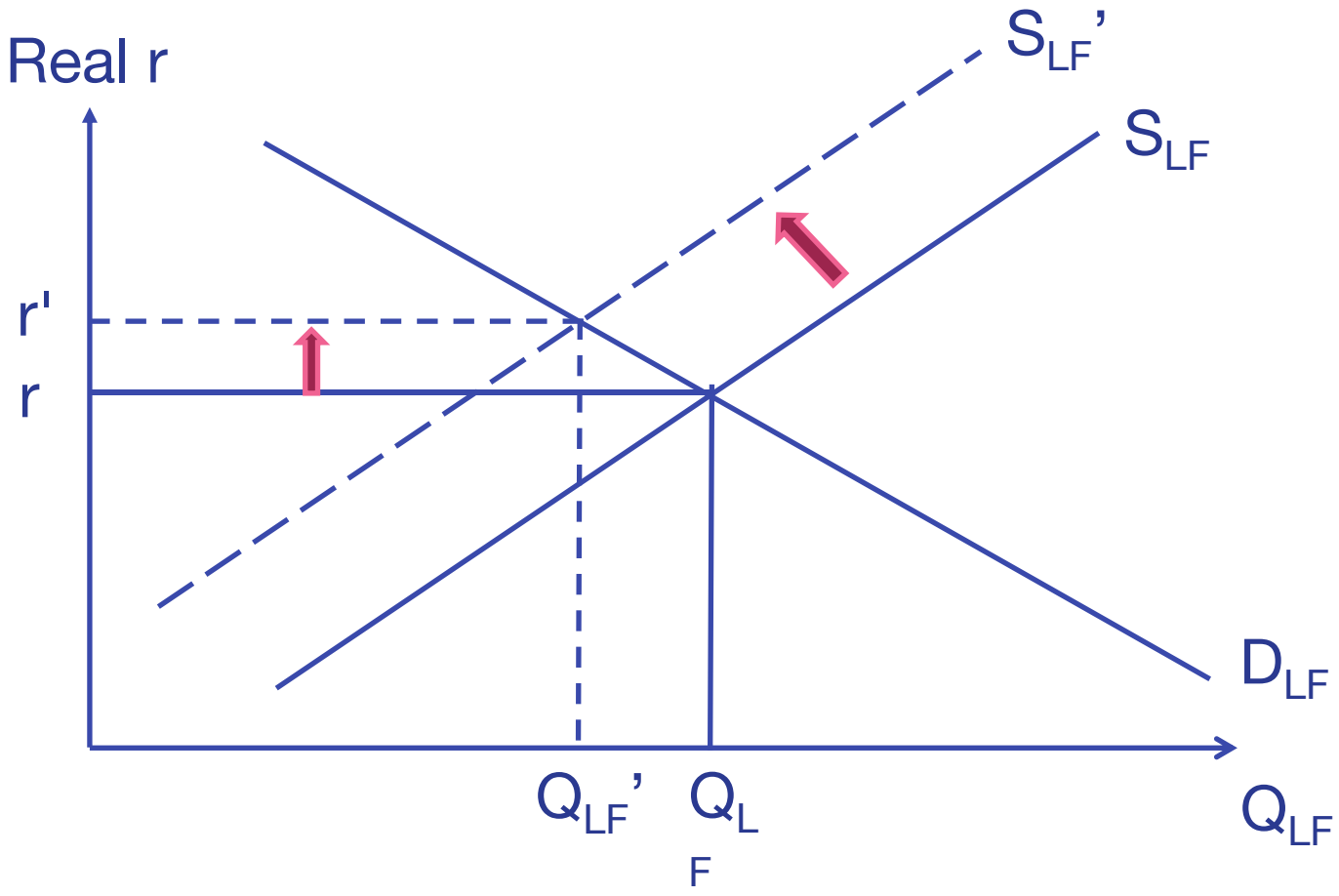
How does Crowding In happen?

- Assume a depressed economy in which companies do not invest because income is falling.
- Governments step in and borrow from society to fund investment
- People are employed and use their income to consume. Prospects are revived. Companies start to invest because of higher consumption.
- Public spending leads to private investment.

Crowding Out Example

- Let's assume a new income transfer program
- The government needs to finance it and does so by running a primary deficit and issuing debt to cover it.
- On the market for Loanable Funds, there is a decrease in the supply of loanable funds, from S_{LF} to S_{LF}' and The interest rate goes up, from r to r', and the quantity of loanable funds decreases, from Q_{LF} to Q_{LF}'.
- This decrease means that private businesses invest less, displaying the crowding out effect: as government expenditure rises, it displaces private investment

Crowding Out Example



Crowding Out in the Real World

- Crowding out is a common phenomenon in financial markets all over the world, but the extent of the effect is what matters in economic dynamics and for the design of economic policies.
- Perfect crowding out would nullify any consequences of government expenditure and fiscal policy would be completely neutral.

To what extent does public deficit crowd out private investment?

The answer relies on a number of variables:

- Government credibility;
- Ricardian equivalence;
- Time inconsistency;
- The position of the economy in the business cycle.

Chapter 8.2.1

Government credibility and financing public works

Government Bonds Credibility

- Governments issue bonds in local currency
- **Government bonds are considered the safest asset in the economy and their interest rate is that economy's risk-free interest rate**

Why are government bonds considered safe?

Public authorities can offer something that no other economic agent can: a printing press producing money that can cover all government debts

Government Bonds Credibility

However, with that in mind, that power is not absolute.

Expectations matter. Governments can do less if market agents do not have confidence in the capacity of public authorities to adequately manage the long–term debt of the country.

If there is a situation in which the debt is growing explosively, market agents may decide that government bonds are not the safest asset in the economy. People would refrain from financing public expenditure, interest rates would rise and the government's only option would be to print money.

Financial Markets and Government Credibility

Ratings agencies are responsible for presenting perceived risks related to the trajectory of the public debt.

August 5, 2011, Standard & Poor's, announced its first-ever downgrade to U.S. sovereign debt, lowering the rating from "AAA" to "AA+," after the rapid increase in the ratio of the US public debt to GDP.

The Importance of Credibility

Modern money is *fiat* i.e. it relies on private and public agents perceiving financial markets to be functioning well.

Credibility is transmitted along with other variables to financial markets through demand and supply for government bonds in the secondary market. If interest rates on long-term bonds are very low, it is a signal that market agents are willing to buy such bonds even at low yields, probably because they consider that there is a very low risk of mismanagement of public debt over time.

The Importance of Credibility

Why do Central Banks in emerging countries find it difficult to issue bonds of long–term maturities?

The main reason is that most of these countries have had fiscal crises in their recent past and market agents are not prepared to buy bonds of long maturities unless they are handsomely compensated for this extra risk. Extremely high interest rates discourage governments from issuing such long term maturity bonds. As a result, most 30–year bonds are emitted by developed countries.

Chapter 8.2.2

Ricardian equivalence

What is Ricardian Equivalence?

- Hypothetical situation named after 19th century economist David Ricardo.
- If Ricardian Equivalence holds, households and companies are forward looking rational agents: they know that if governments are running a deficit today, they will need to run a surplus tomorrow.
- If policymakers increase public expenditure, households and businesses respond by curtailing consumption and investment, preparing themselves for a future increase in taxes to compensate the present spending hike.
- Government spending would have no effect on economic activity.

Ricardian Equivalence in the Real World

In 1992, President George Bush enacted a policy which Gregory Mankiw analyzed: “by executive order, he lowered the amount of income taxes that were being withheld from spenders' paychecks. The order did not reduce the amount of taxes that spenders owed; it merely delayed payment. The higher take-home pay that spenders received during 1992 was to be offset by higher tax payments, or smaller tax refunds, when income taxes were due in April 1993.”

If people were perfectly rational and forward-looking, they would not change their consumption and spending patterns compared with previous years.

Ricardian Equivalence in the Real World

President Bush claimed his policy would provide "money people can use to help pay for clothing, college, or to get a new car."

He believed that consumers would spend the extra income, thereby stimulating aggregate demand and helping the economy recover from the recession.

Ricardian Equivalence in the Real World

Shortly after the policy was announced, Matthew Shapiro and Joel Slemrod (1995) asked people what they would do with the extra income:

- Fifty-seven percent of the respondents said they would save it, use it to repay debts, or adjust their withholding
- Forty-three percent said they would spend the extra income

There were enough people who were not fully rational for the spending to have an economy-wide effect. Ricardian equivalence, if present, limits the effect of public expenditure on aggregate demand.

Chapter 8.2.3

Time Inconsistency

What is time Inconsistency?

- Time inconsistency happens when the preference of public authorities changes over time.
- Public authorities have incentives to change their mind about an earlier promise, if the economic effect has already happened.
- Time inconsistency happens a lot in poor countries that over promise to twist the arm of foreign investors.

Economic Effect of Time Inconsistency

- The higher the probability that public authorities may show time inconsistent preferences, the smaller the likelihood that market agents will want to finance public debt.
- Time inconsistency and credibility are the reasons why some emerging countries try to set up rules that constrain public policies.
- Balanced budget laws, for instance, require that governments should not undertake expenditure higher than the tax revenue.

Chapter 8.2.4

Business Cycles and Public Debt

The Natural Cycle of Public Deficit and Debt

- In theory, it is the government's job to smooth out the business cycle.
- However, in practice, things are rarely that simple.
- For example, Greece in the early 2010's: The government could not spend money to loosen the recession due to weak financial state of the economy.
- **Important lesson**: even if no action is taken, public deficit and debt still change with the business cycle.

Public Deficit Trends in the case of Inaction

Let's assume a fixed amount of public deficit (or surplus) and a government that simply maintains the same levels of spending over time.

There are two reasons public deficit and the ratio of public debt/GDP might change: tax revenues and GDP. Tax revenues change along the business cycle; in a recession, income and corporate taxes go down as economic activity slows down; in a boom, tax revenues increase accordingly.

The Public Debt/GDP ratio tends to increase during a recession and decrease in an expansion period.

Chapter 8.2.5

The Fiscal Multiplier

The Fiscal Multiplier

The fiscal multiplier measures the dynamic effect of public budget decisions on economic activity.

$$fm = \frac{b}{t}$$

where *fm* is the fiscal multiplier, *b* is the propensity to consume, and *t* is the average income tax rate.

Fiscal Multiplier Higher than 1

- If it is higher than 1, it means that if the government increased spending or reduced taxes by USD 1, the country's GDP would grow by more than USD 1.
- Public authorities would be able to create prosperity simply by spending more or reducing taxes on households and companies.
- If there is a growth gap, then by investing in the economy the government increases employment.

Rising income by households leads to higher consumption, which boosts profits and expectations regarding economic recovery. Companies invest to meet a surging demand, leading to more employment, consumption, and so on and so forth.

Does the fiscal multiplier even exist?

Without credibility, the fiscal multiplier cannot be higher than 1.

Fiscal Multipliers are context dependent. Factors such as the country's level of development and institutional credibility affect the fiscal multiplier. Hence the answer to the question is: It depends.

Public expenditure may crowd out investment. However, in some instances, public spending may **crowd in** investment.

Economic Impacts of Fiscal Multipliers

- Crowding out limits the action of governments.
- In a situation of a growth gap in which financial markets provide ample liquidity and the ratio of debt to GDP is low, fiscal spending or lowering taxes should abbreviate a recession (fiscal multiplier >1).
- However, with an economy close to full employment, or a government that is already highly indebted, profligacy may crowd out private investment, and destroy social welfare.

As with everything in this course, understanding a country's economic context is key to determining the effect of the fiscal multiplier.

Chapter 8.3

Hyperinflation and Public Deficit

How does Hyperinflation Occur?

Hyperinflation occurs when governments finance their debt by mostly printing money.

It is the result of a total lack of credibility in the government, which cannot issue debt.

We can see this from the quantity theory of money, MV=PY. Assuming that the velocity of money (V) is fixed and that the public deficit has no impact on economic activity, then increasing the money supply (M) only leads to an increase in prices.

Hyperinflation in Zimbabwe

- In 2008, the monthly inflation rate in Zimbabwe was 3.5 million percent.
- The country continued to run a deficit, leading to less credibility in its ability to pay back its debt.
- As a result, the Zimbabwean government printed money, which sparked a rise in prices and a change in expectations.
- To restore credibility, the country defined foreign currencies as the means of payment in local markets.

Hyperinflation in Venezuela

- Government resorted to printing money to finance its deficit, which resulted in hyperinflation.
- Government stopped announcing inflation rates in mid-2014.
- Public deficit in 2013 was 11.5% of GDP, and by 2015 had grown to more than 16% of GDP.

Historical Cases of Hyperinflation

Country	Date	Highest monthly inflation rate	E q u i v a l e n t daily rate	Time required for prices to double
Hungary	July 1946	1.30 x 10^{16}%	195%	15.6 hours
Zimbabwe	Nov 2008	79,600,000,000%	98.0%	24.7 hours
Yugoslavia	January 1994	313,000,000%	64.6%	1.4 days
Germany	October 1923	29,500%	20.9%	3.7 days
Greece	Nov 1944	11,300%	17.1%	4.5 days
China	May 1949	4,210%	13.4%	5.6 days

The Missing Inflation of the 2010's

Inflation remained low after the Quantitative Easing introduced by the Federal Reserve. But what about the fiscal side of the story?

Due to the failed transmission mechanisms of monetary policy, the rise in money supply did not lead to inflation. In addition, financial markets might have been going through a liquidity trap. In 2009, the primary deficit was 9.8% of GDP and in 2010 totaled 8.6% of national income.

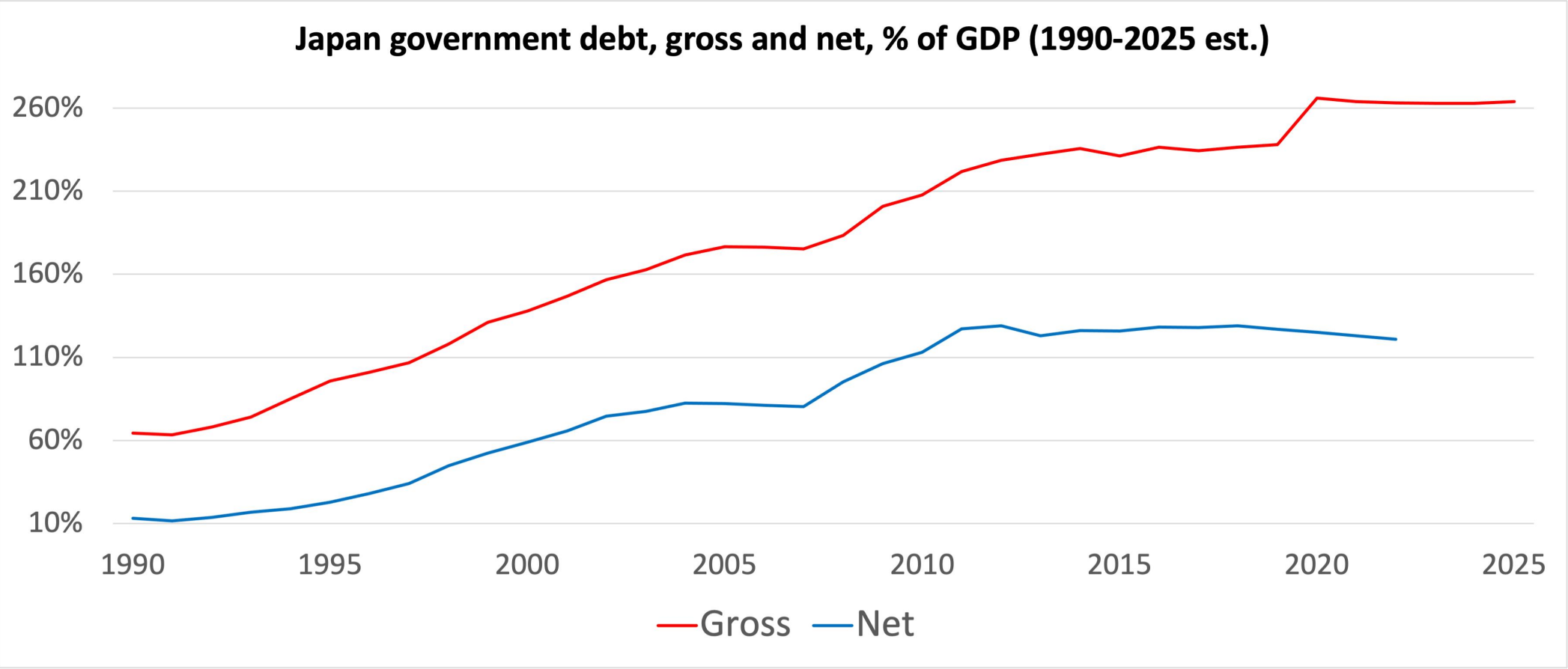
The Missing Hyperinflation of the 2010's

QE increased the supply of loanable funds and most of them did not filter to the real side of the economy. On the fiscal side, the central government did curtail the deficit, and the economy stabilized. But it did not generate a loss of credibility in the fiscal authority.

Important Lesson: Inflation is not only a question of how much money is printed. Currency debasement follows from persistent fiscal deficits that cannot be financed by the debt issuing government.

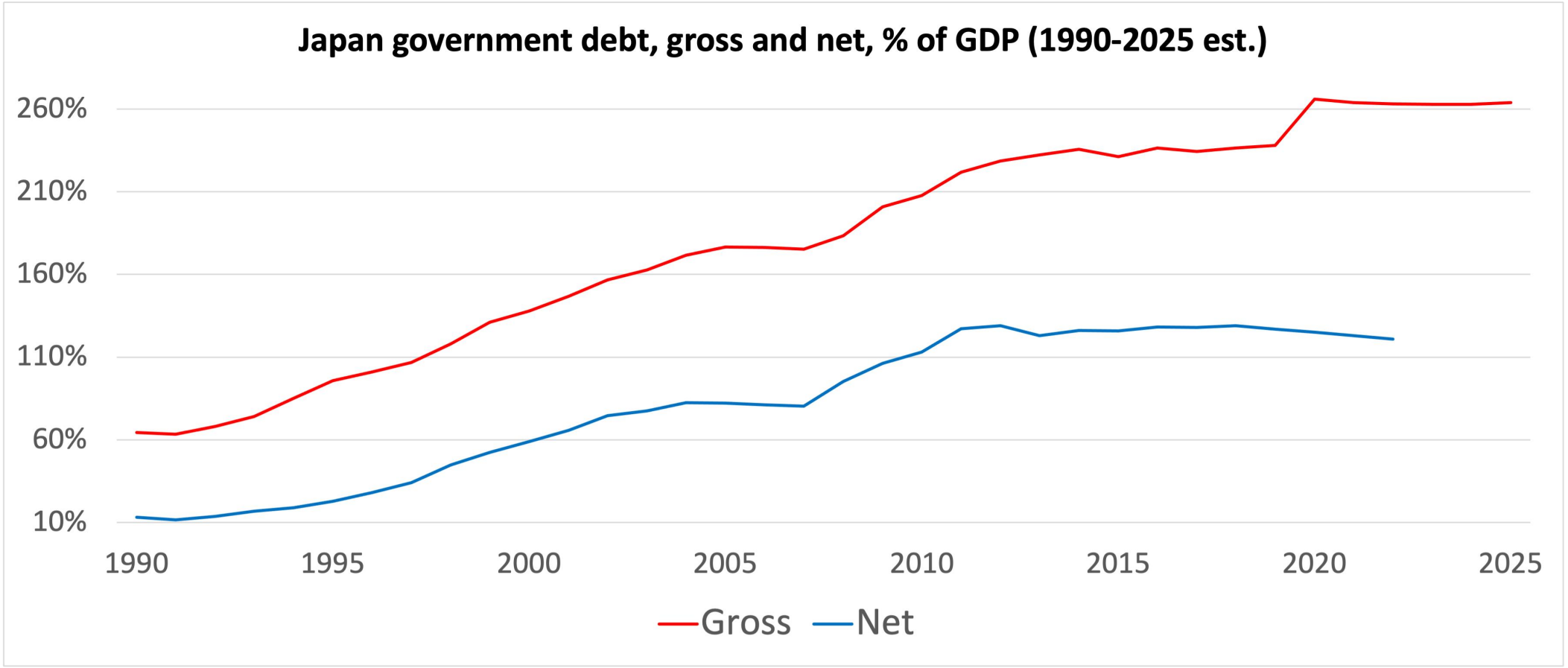
Japan, Credibility and 250%

The Japanese economy has been underperforming since the 1990's, with the public deficit rising steadily to rescue the banking system and revive the economy.



Japan, Brazil, Credibility and 250%

In 1990 gross government debt stood at 67% of GDP. Gross debt rose from 183% in 2008 to a little more than 250% in 2016.



Japan, Brazil, Credibility and 250%

The OECD estimates that Japan's gross debt should reach over 400% of GDP by 2040. Even so, the country has had interest rates close to zero for most of the 21st century. Two factors make this situation possible:

- Most of Japanese debt is held by local investors.
- The Japanese government has retained confidence in its ability to manage the economy.

However, interest rates in emerging markets tend to be high

Japan

- 2016 average yield on Japanese government bonds: 0.25%
- Fiscal cost for Japan: little over 0.6% of GDP
- Average Maturity of Japanese Debt: 7 years

Brazil

- 2017 average yield on Brazilian government bonds: 10%
- Fiscal Cost for Brazil: almost 4% of GDP
- Average Maturity of Brazilian Debt: Less than half of Japan's

The main difference, which results in much higher costs to Brazilian society when compared to the Japanese one, is the confidence in the two governments and their debt management

Chapter 8.4

Who sets the interest rate?

Determining Interest Rates after the Financial Crisis

- Standard Money Market Model: interest rate is the monopoly of the central bank (through open market operations).
- The present model of public budget and its relation to expectations puts constraints in the ability of central banks to solely determine interest rates.
- In normal times, when central banks do not face confidence crises they can certainly set the nominal interest rate and affect the real one by shifting money supply.
- However, as you have learned so far, policy-making and its implementation is heavily **context-dependent,** and after the crisis central banks cannot directly set interest rates as they wish to.

Determining Interest Rates after the Financial Crisis

- In some situations, like a confidence crisis or liquidity traps, central banks may not have an effect at all.
- In countries with tight controls over financial markets, like China, central banks have a huge influence over the behavior of commercial banks and the market rates..
- Expectations and confidence play a significant role in the movements of financial markets

Confidence in public authorities is central for any policy to have an effect on real markets.

Chapter 8.5

The instruments of fiscal policy and public debt management

The Complexity of Public Finances

- Managing public finances is one of the most important roles of public authorities.
- Balancing the expenses, investment, and revenues of a state is extremely difficult, and the performance is usually influenced by a country's level of development.
- Wealthier nations have costlier governments, while in most poor states politicians are viewed with some suspicion.

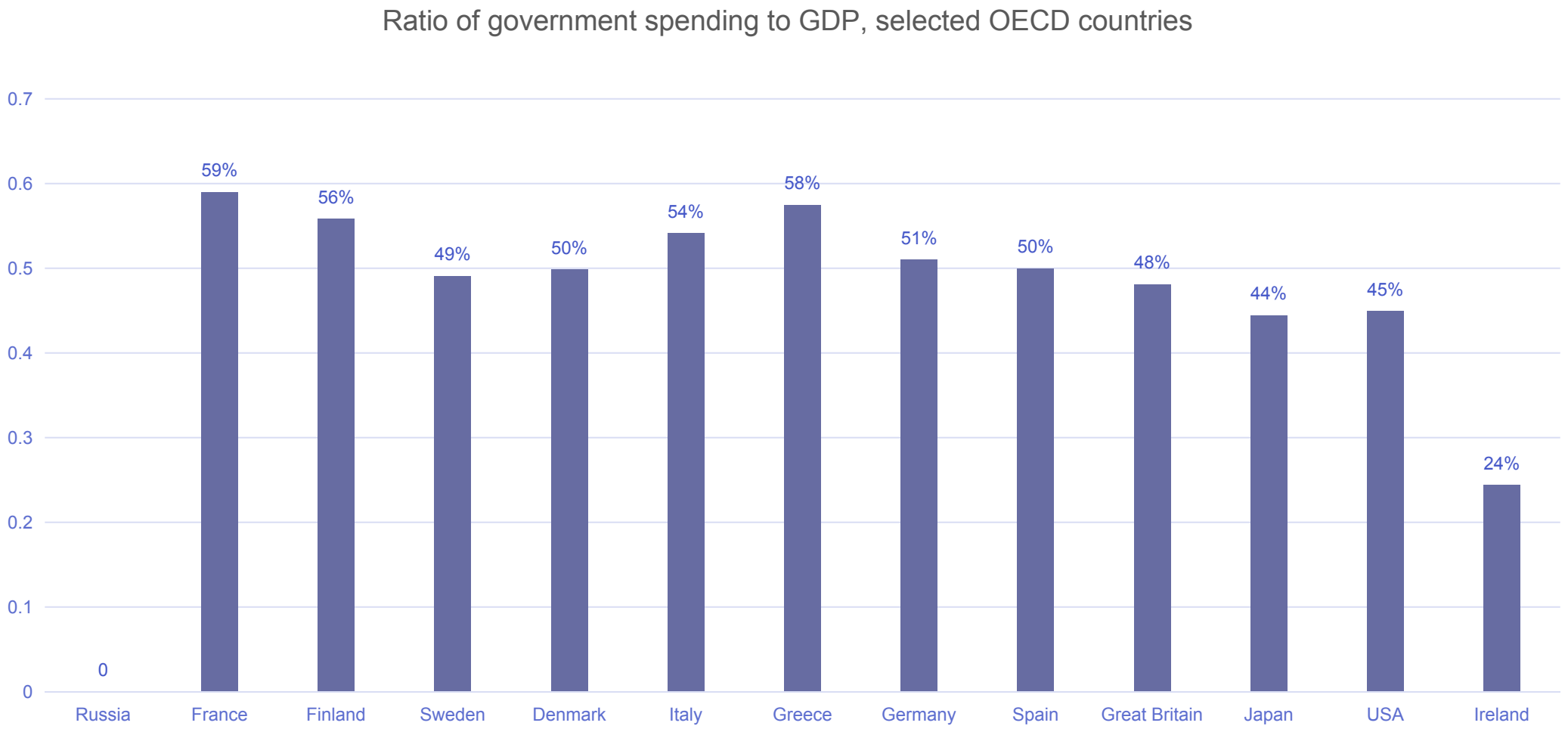
Social Norms: The USA and Denmark

Social Norms affect the management of public finances.

For example, in the United States, the culture favors individuality. In Denmark, there is a more collective spirit.

This contrast in norms influences how public finances are spent and managed. The next slide shows the differences in spending amongst nations, and how that is influenced by cultural and social norms prevalent those societies.

Social Norms



Source: OECD (2024)

Social Norms

- Among rich economies, Scandinavian countries and France have the largest governments, as measured by the ratio of general government spending to GDP
- The United States government spends roughly 38% of GDP, below the OECD average of 45%
- Japan and South Korea have relatively smaller governments than European countries.

The case of Poor Countries

Only extremely poor countries have small governments relative to GDP; Afghanistan, Bangladesh, Mali and Honduras all spend less than 20% of GDP.

This is because they tax and spend little. Low legitimacy creates barriers for government to raise taxes. The same is true because of low credibility and commitment.

Importance of Government Size

The size of the government matters for economic policy – the capacity of the government to change taxes and decide on public spending is what makes fiscal policy possible.

Raising taxes discourages economic activity, and decreasing them should favor it. By increasing public investment, governments can affect aggregate demand, reducing it if they decide to decrease investment.

Public Debt Management

- Refers to the actions of governments regarding the trajectory of public debt
- Policymakers affect the debt through the primary deficit and the interest rate
- The higher the deficit and the amount of interest, the faster the debt rises

Example of Context-dependency: The faster public debt grows, the less credible policymakers are, and the smaller the space for increased spending

However, focusing solely on limiting debt restricts the actions of policymakers. E.g. In the case of a recession, there may be less spending.

Public Debt Management: Conflicting Interests

The presence of interest groups makes public spending and debt management difficult tasks for public authorities.

Examples of conflicts:

- Corporations fighting for less taxes
- Public employees fighting for higher wages
- Raises to pensioners

Due to these reasons, it is difficult to implement new policies, and as always, policymakers should consider the context before going through with a plan.

Indonesia and the link between credibility and fiscal policy

The country's case shows how important credibility is when enacting economic policies, especially in the case of emerging countries.

In 2015, after growth was less than what was expected, there was a shortfall in tax revenue. Thue budget as a share of GDP was –2.5%, rather than government predictions of –1.9%.

The country has a semi-balanced budget law. The public deficit is not supposed to be higher than 3% of GDP. What happens in this case?

Indonesia and the link between credibility and fiscal policy

A fiscal stimulus would have made the deficit go over its constitutional limit, and would have been an example of time inconsistency.

The tradeoff for Indonesian policymakers was either try to reap short term benefits and give up the constitutional limit on the size of the public deficit, or contain the growth of the deficit and ride out the economic downturn, building credibility for future government actions.

In times of difficulty, rules enacted by the government to create credibility pose a problem and may even restrict the actions of policymakers.

Neutral tax reforms in the United States

After the election of Donald Trump, Republicans proposed a neutral tax reform in order to facilitate economic growth, influence income inequality, and a combination of the two.

A neutral tax reform aims to rearrange the tax system in a way that keeps tax revenue constant. If done right, it can generate prosperity. In the case of the US, where tax laws are complicated, a tax reform that simplifies the tax code but does not increase the total amount collected may generate welfare due to economic efficiency.

Neutral tax reforms in the United States

The design of tax systems has a significant impact on income inequality. One of the reasons that income distribution is different in Scandinavia than the US is that each country's government chooses distinct tax structures. (The highest marginal income tax is 56% in Denmark and 39.6% in the US.)

Tax reforms also influence how resources are allocated in terms of their potential impact on the environment, as they have a significant impact on the behavior of consumers and productions.

Tax Reforms and its Environmental Impact

Markets cannot capture the environmental impact of certain economic activities, such as greenhouse gas emissions. Hence, the introduction of a tax reform may have a significant effect on the situation.

For example, most countries subsidize the production of oil. However, if they moved to taxing its production or use, there would be a significant impact on fossil fuel emissions.

Tax reform is an opportunity to change incentives in terms of inequality of the impact of economic activity on society and the environment.

Tax Reforms: The Lessons

A proposal for a neutral tax reform may affect three social welfare variables: potential growth, income inequality and the sustainability of economic activity.

When designing a tax reform, policymakers should measure its effect in terms of income inequality and negative externalities.