Tools of Budget Analysis

(Chapter 4 in Gruber's textbook)

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GOVERNMENT BUDGETING

Debt: The amount borrowed by government through bonds to individuals, firms, or foreigners. Debt is a **stock**

Deficit: government's spending + interest payments on debt minus government revenues in a given year. A negative deficit is called a surplus. Deficit is a **flow**

Evolution of debt from year to year:

$\text{Debt}_{t+1} = \text{Debt}_t + \text{Deficit}_t = \text{Debt}_t \cdot (1 + r_t) + \text{Spending}_t - \text{Revenue}_t$

with r_t interest paid on government debt

Primary Deficit = Spending - Revenue

US Federal debt (held outside govt) is \$21Tr around 100% of GDP, 2020 US deficit huge 16% (\$3.5T) of GDP bc COVID

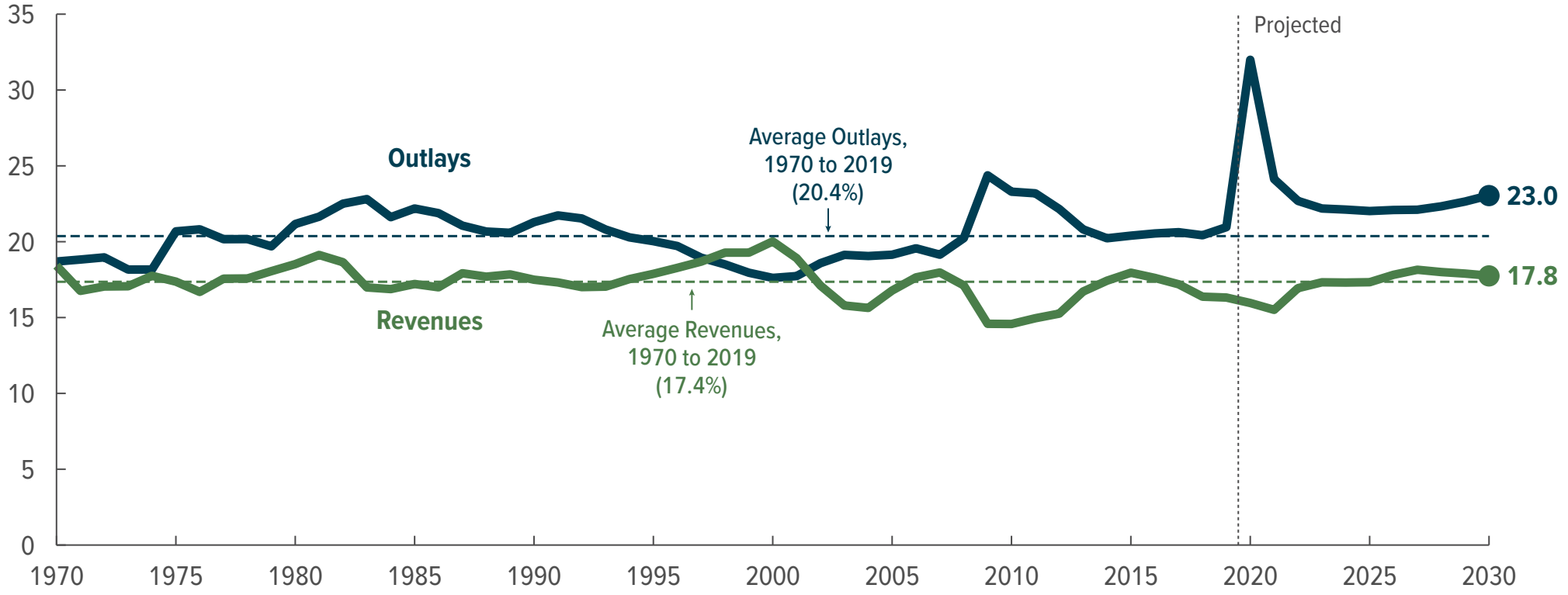
US government owns assets worth about 80% of GDP

Figure 4.

Total Revenues and Outlays

US Federal government only (excludes state+local)

Percentage of Gross Domestic Product

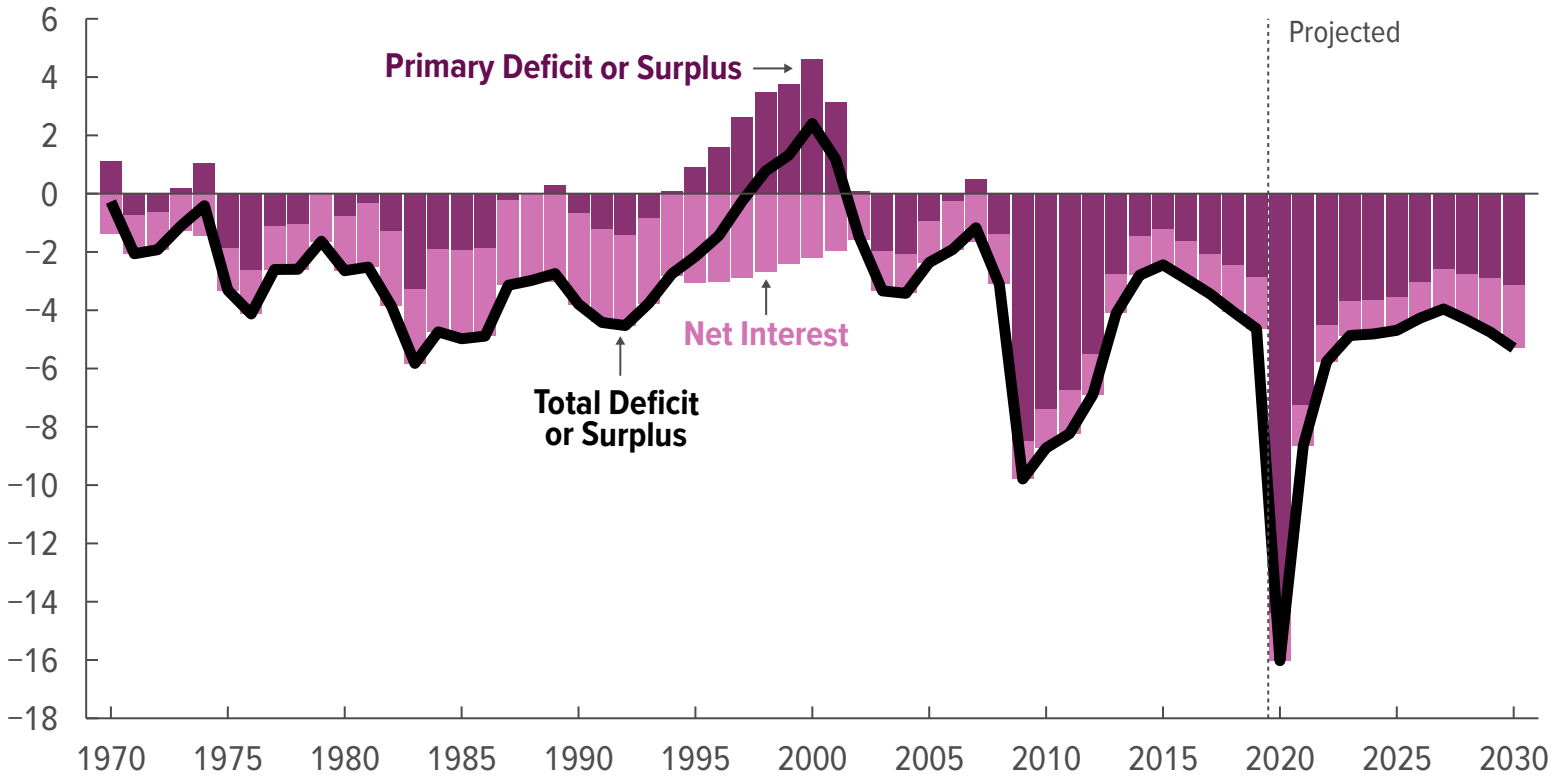


Source: Congressional Budget Office.

Figure 2.

Total Deficit, Primary Deficit, and Net Interest

Percentage of Gross Domestic Product



In CBO's projections, primary deficits increase in 2020 and then decrease over the next several years before increasing again at the end of the projection period. Total deficits increase more rapidly in those final years, however, because of rising interest costs.

Source: Congressional Budget Office.

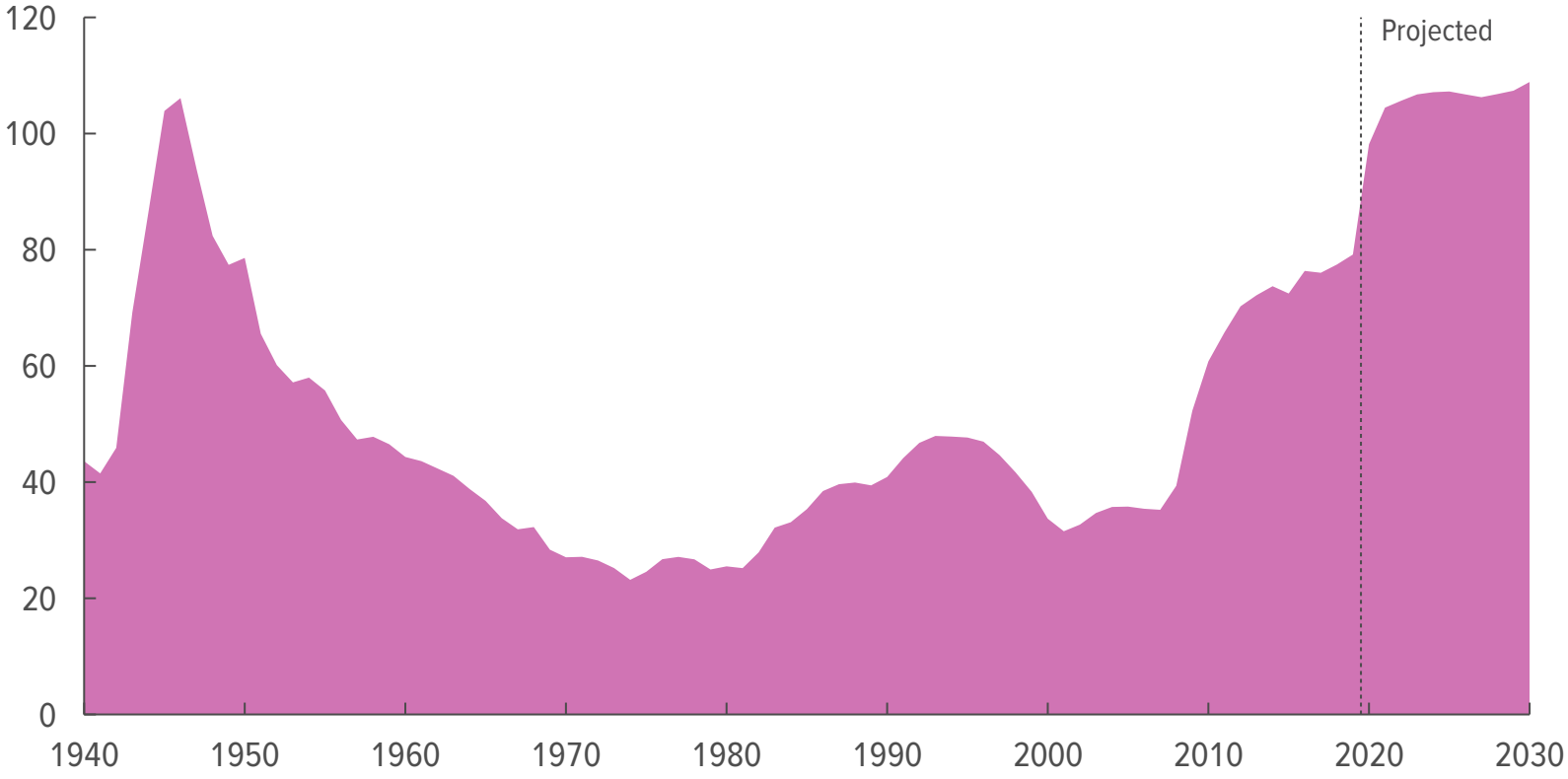
Primary deficits or surpluses exclude net outlays for interest.

When October 1 (the first day of the fiscal year) falls on a weekend, certain payments that would ordinarily have been made on that day are instead made at the end of September and thus are shifted into the previous fiscal year. All projections presented here have been adjusted to exclude the effects of those timing shifts. Historical amounts have been adjusted as far back as the available data will allow.

Figure 3.

Federal Debt Held by the Public

Percentage of Gross Domestic Product



Federal debt has increased sharply this year and is projected to increase in most years over the coming decade. Beginning in 2023, debt would be higher than at any other time in the nation's history.

Source: Congressional Budget Office.

GOVERNMENT DEBT SUSTAINABILITY

$$\text{Debt}_{t+1} = \text{Debt}_t + \text{Deficit}_t$$

Debt/GDP stable when Deficit less than GDP nominal annual growth g

g around 5% per year = 2% price inflation + 1% population growth + 2% real growth per capita

$$\text{Deficit}_t = r_t \cdot \text{Debt}_t + \text{Spending}_t - \text{Revenue}_t$$

with r_t nominal interest on debt

Debt can snowball when r_t exceed g_t

Since 2008, in the US, $r_t \simeq 1.5\%$ much lower than $g_t = 5\%$

$\Rightarrow$ US debt sustainable as long as primary deficit Spending-Revenue less than 3% of GDP and r stays low

GOVERNMENT DEBT IN CLOSED ECONOMY

Govt borrows from private sector (ultimately individuals).

Government debt increases private wealth at the expense of public wealth

$\Rightarrow$ No direct effect on national wealth = private wealth + public wealth in closed economy

Govt debt is not borrowing on the back of future generations but rather changing the distribution of wealth

High debt with high interest rate limits spending ability of govt (as taxes must pay first interest on debt)

Today: US (and most EU countries and Japan) have very low interest rate on govt debt: about 0% in real terms

$\Rightarrow$ Makes govt debt more attractive than taxes for spending

GOVERNMENT DEBT IN OPEN ECONOMY

Govt debt can also be borrowed from abroad

In this case, govt debt is indeed making future generations poorer (indebted to other countries)

1/3 of US debt ($7T) held abroad but US also owns foreign assets that pay higher returns

US debt held abroad primarily by foreign central banks that use it as reserves

While interest rate is low, this is a good deal for the US

If interest rate increases, it will be perceived in US as a heavy burden to be paid to foreigners

Many developing countries have been caught in cycles of unsustainable govt debt borrowed from foreigners

THE US FEDERAL PROCESS

Taxes, spending, and debt ceiling are decided by Congress and the President

Any new law requires majority vote both in House and in Senate along with President's signature (veto power)

In recent years, Senate vote requires 60/100 super-majority (due to filibuster)

Two forms of spending:

Entitlement spending: Mandatory funds for programs for which funding levels are automatically set by the number of eligible recipients (ex: medicare, social security)

Discretionary spending: Optional spending set by appropriation levels each year, at Congress's discretion (ex: defense)

Failure to pass appropriation results in Fed govt shutdown

Short-Run Effects of the Govt on the Macroeconomy

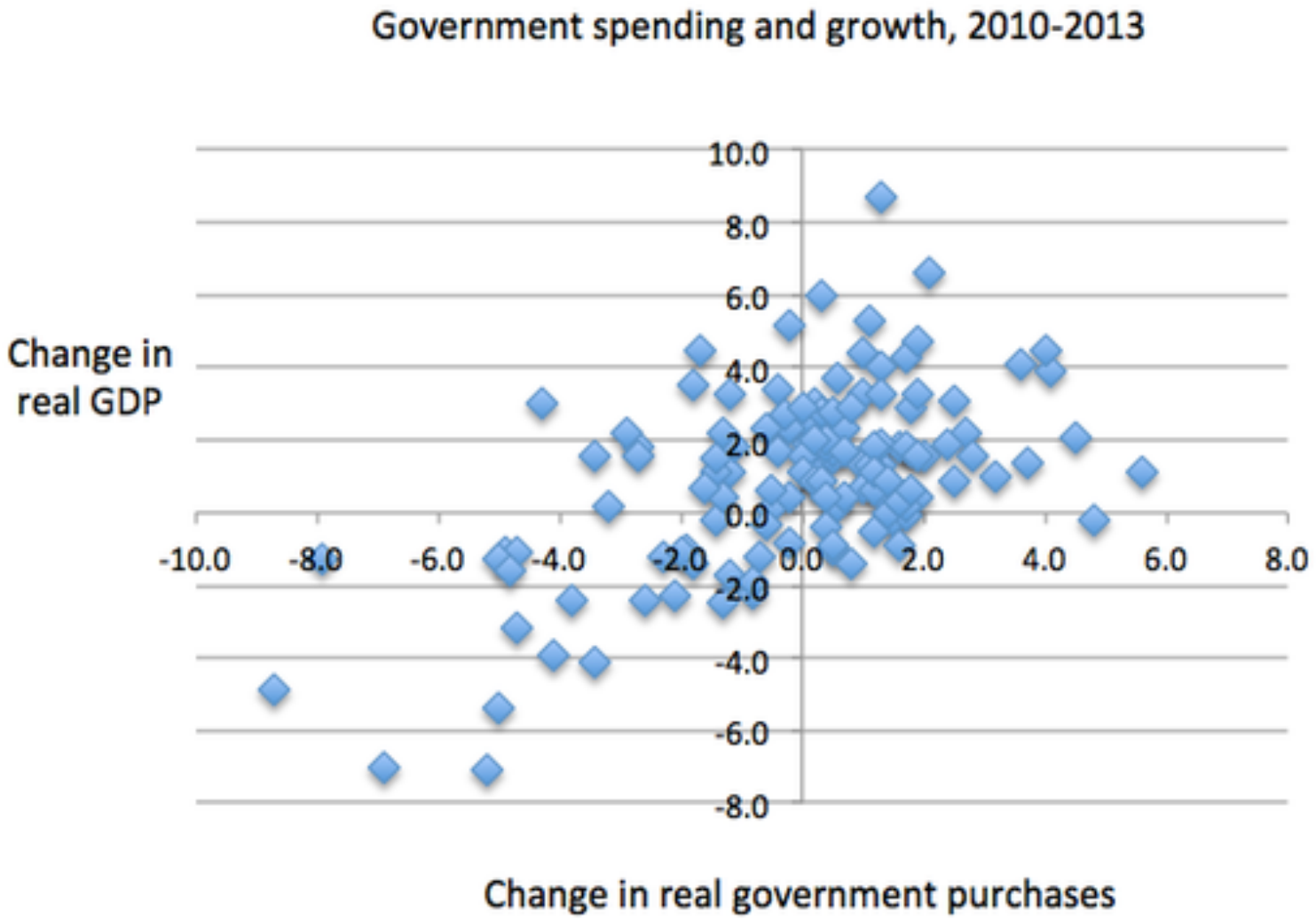
Keynesian theory (IS-LM macro model): More government spending or tax cuts stimulates the economy in the short-run [and conversely]

Short-run stabilization: Govt can use taxes and spending policies to smooth the peaks and troughs of the business cycle

Automatic stabilization: Policies that automatically alter taxes or spending in response to economic fluctuations to offset changes in household consumption levels (ex: unemployment insurance, progressive taxation, corporate profits tax)

Discretionary stabilization: Policy actions taken by the government in response to business cycle (ex: Fiscal stimulus with Spring 2008 rebate checks, 2009-12 Obama stimulus, COVID care acts)

$\Rightarrow$ Ability to run deficits in recessions is a great tool for short-run business cycle stabilization



% changes in annual real govt spending and changes in real GDP, 33 EU countries, 2010-11, 2011-2, 2012-3 (=99 dots). Source: Krugman NYtimes blog, January 6, 2015

Budget Policies and Deficits at the State Level

In contrast to Federal govt, States have budget balance requirements forcing spending to equate tax revenue each year

In downturns, tax revenue falls due to decreased incomes $\Rightarrow$ Forces states to either cut spending and increase taxes $\Rightarrow$ Further exarcerbates the economic downturn

California had to cut spending drastically during Great Recession 2008-2010 $\Rightarrow$ California established a rainy fund for future hard times but it remains too small

Absent federal help, COVID crisis is forcing states to cut spending as well (CA tax revenue is doing fine because the very rich have done well and continue to pay taxes)

STATIC VS. DYNAMIC SCORING

Govts have agencies evaluating effects of proposed reforms on govt deficit (Congressional Budget Office for US fed govt)

Static scoring: A method used by budget modelers that assumes that government policy changes only the distribution of total resources, not the amount of total resources.

Dynamic scoring: A method used by budget modelers that attempts to model the effect of government policy on both the distribution of total resources and the amount of total resources.

Example: tax decreases on the rich, static scoring assumes no effect on GDP, dynamic scoring incorporates effects on growth

Static scoring is safest in the absence of good empirical estimates of growth effects (dynamic scoring can be manipulated by ideologues, see Lynch 2015 for detailed pros/cons)

Intertemporal Government Budget Constraint

Policy debates have traditionally focused on the extent to which this year's governmental spending exceeds this year's governmental revenues.

The existence of implicit obligations in the future, however, suggests that this does not capture the full picture

E.g. population aging increases cost of social security and Medicare

Intertemporal budget constraint: An equation relating the Present Discounted Value of the government's obligations to the Present Discounted Value of its revenues.

PDV of Tax Payments =
PDV of All Future Govt Spending + Current Govt Debt

BACKGROUND: PRESENT DISCOUNTED VALUE

For govt, spending F now has the same cost as spending $F \cdot (1+r)$ next year with r interest rate on government debt

Present discounted value (PDV): The value of each period's dollar amount in today's terms.

Govt spends F_1, $F_2, F_3, ...$ in each future year, then the PDV is computed as:

$$PDV = \frac{F_1}{(1+r)} + \frac{F_2}{(1+r)^2} + \frac{F_3}{(1+r)^3} + ...$$

If $F_1 = F_2 = .. = F$ then

$$PDV = \frac{F}{1+r} \cdot \left[1 + \frac{1}{(1+r)} + \frac{1}{(1+r)^2} + ... \right] = \frac{F}{1+r} \cdot \frac{1}{1 - \frac{1}{1+r}} = \frac{F}{r}$$

Paying F in perpetuity is equivalent to paying F/r upfront

LONG-RUN FISCAL IMBALANCE

It is defined as gap between

1) PDV of All Future Govt Spending + Current Govt Debt

2) PDV of Tax Payments

If the government continues with today's policies, how much more will the government spend than it will collect in taxes over the entire future?

A long-run fiscal imbalance means that policies will have to be adjusted at some point

Some policies can drastically change the long-run fiscal imbalance even if they don't affect the current deficit much

Example: In 2003, the government added roughly $20 trillion to the fiscal imbalance (due to tax cuts and medicare prescription drug benefit of Bush administration)

LONG-RUN EFFECTS OF GOVERNMENT DEBT

In the long-run, government debt affects the capital market where savers meet investors

In closed economy: private savings = investment + new govt debt

With more government debt, if private savings do not change, less funds available for investment: investment decreases

Two mitigating factors:

1) In an open economy, investment or govt debt can be funded with foreign savings

2) If individuals are forward looking, they understand that higher debt implies high taxes later on and hence they save more to be able to pay higher taxes later on [Ricardian equivalence but not much empirical support]

CONCLUSION

The deficit has been a constant source of policy interest and political debate over the last decade

Short-run: should the govt spend more and increase deficit to stimulate the economy?

Long-run: should the govt address long-term deficits by increasing taxes or cutting spending?

International evidence shows that austerity during the Great Recession worsens the recession

Health care cost growth has slowed down sharply since 2008, substantially improving the long-term Federal budget outlook

But 2018 tax reform has worsened the budget situation

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