Session 15: The Government and the Macroeconomy

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Stanford GSB
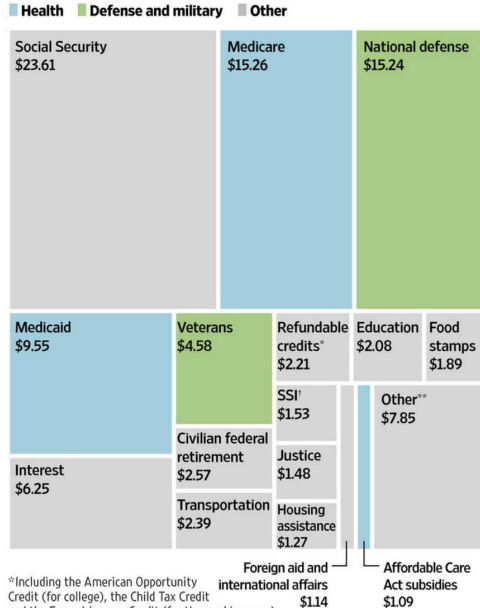
Outline: The Government and the Macroeconomy

- The role of government in the economy

- The government's budget constraint

- How much can the government borrow?

- Fiscal problems in the Eurozone

- The fiscal problem of the 21st century

The U.S. Federal Budget for 2020

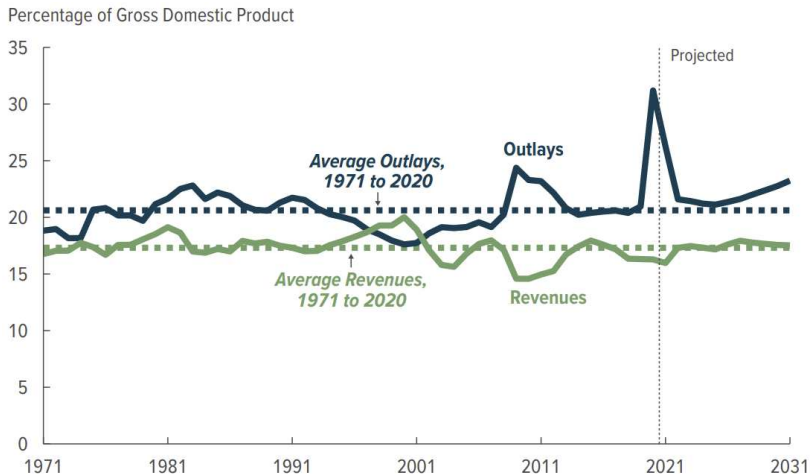|	% of GDP	$/Person
Total Expenditures	31.3	19,800
Health (including Medicare)	7.3	4,600
Social security	5.2	3,300
National defense	3.5	2,200
Income security	6.0	3,800
Net interest	1.6	1,000
Total Revenues	16.3	10,300
Individual income taxes	6.3	4,000
Social insurance and retirement receipts	7.7	4,900
Corporation income taxes	1.0	600
Budget Deficit	15.0	9,500

Allocation of $100 paid in federal taxes for 2016

■ Health ■ Defense and military ■ Other

Social Security
$23.61

Medicare
$15.26

National defense
$15.24

Medicaid
$9.55

Veterans
$4.58

Refundable credits*
$2.21

Education
$2.08

Food stamps
$1.89

Civilian federal retirement
$2.57

SSI†
$1.53

Other**
$7.85

Interest
$6.25

Transportation
$2.39

Justice
$1.48

Housing assistance
$1.27

Foreign aid and international affairs
$1.14

Affordable Care Act subsidies
$1.09

*Including the American Opportunity Credit (for college), the Child Tax Credit

What does the U.S. government do?

... the federal government is basically an insurance company with an army

— Paul Krugman

U.S. Federal Spending and Revenue

Percentage of Gross Domestic Product
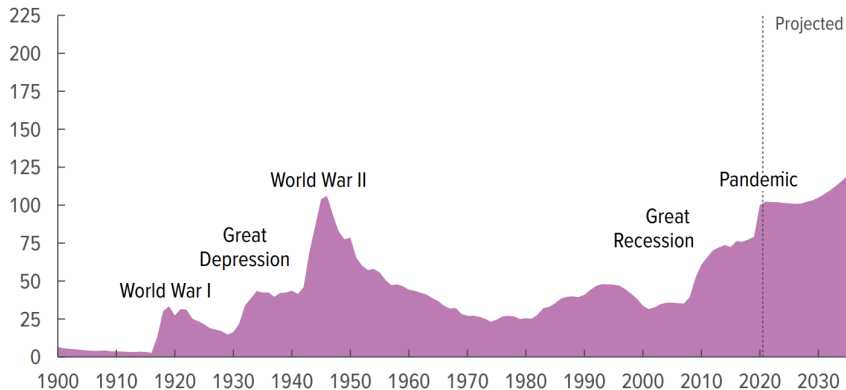
Congressional Budget Office, March 2021

Federal Debt and Deficits in the U.S.

Debt in 2020 = $20.1 trillion
Debt/GDP in 2020 = 96.1%, or $61,000 per person
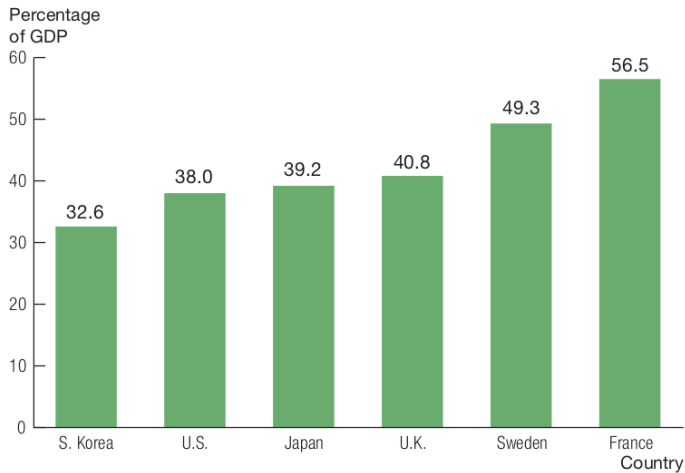This is net. Gross Debt/GDP is 132%

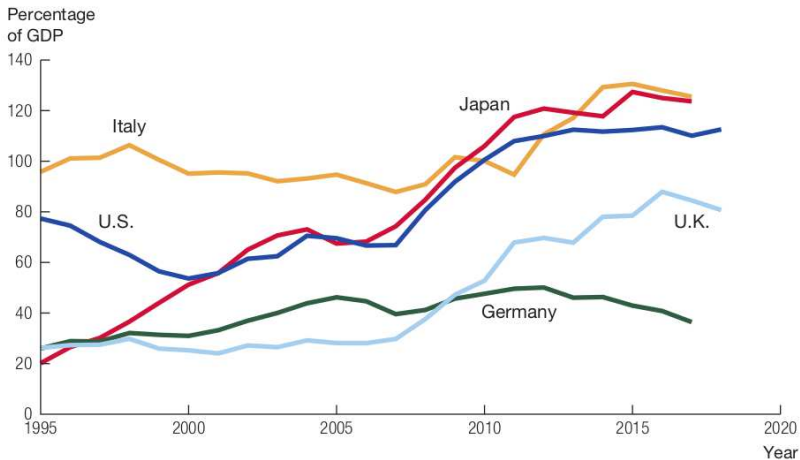# Federal Debt/GDP Historically

Percentage of Gross Domestic Product

Congressional Budget Office, March 2021

Government Spending (all levels) around the World, 2017

Government Debt-GDP Ratios around the World

Note: All levels of government, net of debt held in central banks

The Government
Budget Constraint

The Government Budget Constraint

- The government budget constraint (flow version)

$$\underbrace{G_t + Tr_t + iB_t}_{\text{uses}} = \underbrace{T_t + \Delta B_{t+1} + \Delta M_t}_{\text{sources}}$$

- To simplify: no transfers $Tr_t = 0$, and no money printing $\Delta M_t = 0$

$$B_{t+1} = (1+i)B_t + \underbrace{G_t - T_t}_{\text{deficit}}$$

Two-period example

- For example: $t = 1, 2$

- Since there are only two periods: $B_3 = 0$

$$\underbrace{G_1 + \frac{G_2}{1+i}}_{\text{NPV of expenditures}} + \underbrace{(1+i)B_1}_{\text{outstanding debt}} = \underbrace{T_1 + \frac{T_2}{1+i}}_{\text{NPV of taxes}}$$

$$\underbrace{(T_1 - G_1)}_{\text{surplus today}} + \underbrace{\frac{(T_2 - G_2)}{1+i}}_{\text{future surplus}} = \underbrace{(1+i)B_1}_{\text{initial debt}}$$
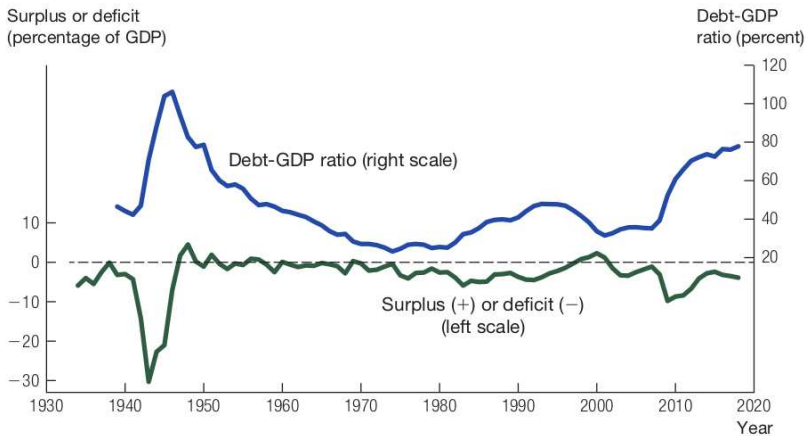
Budgets must balance, not period by
period, but in present discounted value.

How much can the government borrow?

- With infinite horizon, we can roll over the debt as long as we pay back some interest over time

- Suppose the outstanding debt is growing at 2% per year — is that a problem?
  - Must be able to stabilize Debt/GDP ratio at a "reasonable" level.

- Is there a particular debt/GDP ratio at which problems occur?
  - Argentina 2001: Debt/GDP peaked at 65%
  - Greece today: About 175%
  - But Japan today and U.S. after WWII also very high

- Who is owed?
  - Japan: 95% of government debt is held domestically
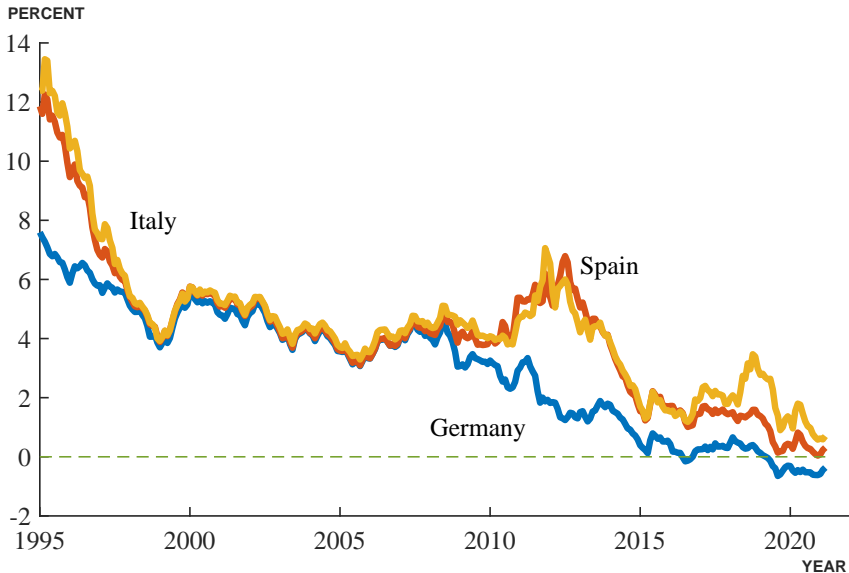 - U.S.: About 1/3 of US debt is held by foreigners

How did the U.S. reduce WWII debt?

Surplus or deficit (percentage of GDP) — left scale. Debt-GDP ratio (percent) — right scale.

Debt-GDP ratio (right scale)

Surplus (+) or deficit (−) (left scale)
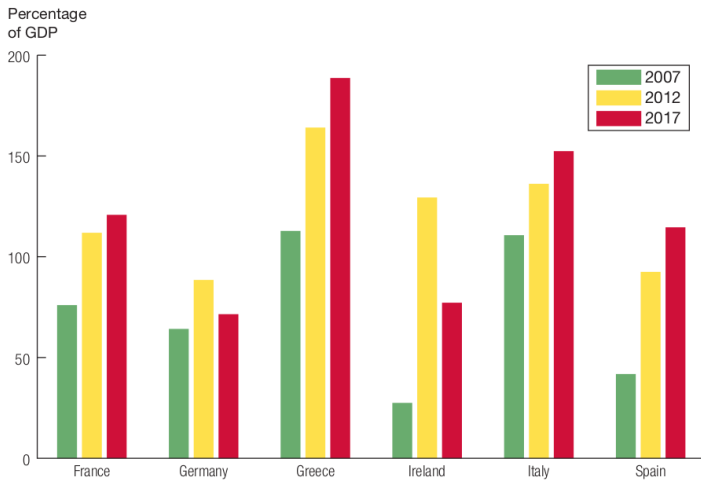
The Eurozone Crisis

10-Year Government Bond Yields

Spread over 10-Year German Bond (today!)

Government Debt in Europe

Default Risk: Self-Fulfilling Crises?

- Imagine a country with 100% Debt/GDP

- If investors think it is safe: low interest rates $i_t = 1\%$

  - Government only needs 1% of GDP to service debt... easy

  - ... so investors were right not to worry (Japan, U.S. after WWII)

Default Risk: Self-Fulfilling Crises?

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  ○ ... so investors were right not to worry (Japan, U.S. after WWII)

- But if investors get worried, they want higher interest rates: $i_t = 8\%$

  ○ Government needs 8% of GDP just to service debt... very difficult

  ○ ... so investors are right to be worried!
    (Europe 2012, Argentina 2001)

The Euro and the ECB

- In 2011 the ECB raised interest rates

  - recession, inflation expectations?

  - what if they leave the Euro?

- In late 2011 new ECB President: Mario Draghi

  - Massive loans to banks in distressed countries

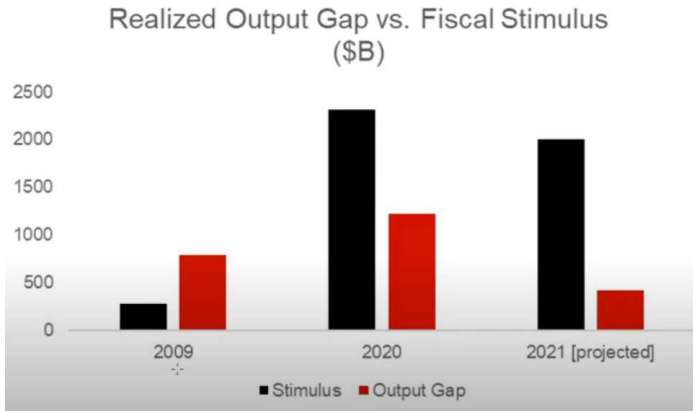 - Buy government debt and accept it as collateral as if it was safe

"Within our mandate, the ECB is ready to do whatever it takes to preserve the euro, [...] believe me, it will be enough."

— Mario Draghi, President of the ECB July 2012

Austerity vs. fiscal stimulus

- Many European countries tried austerity

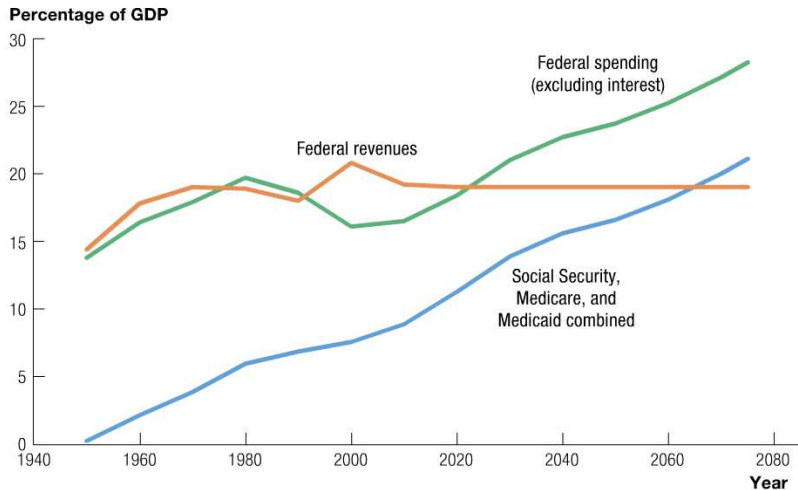 ○ short run vs. long run?

- Reading: Summers on US stimulus

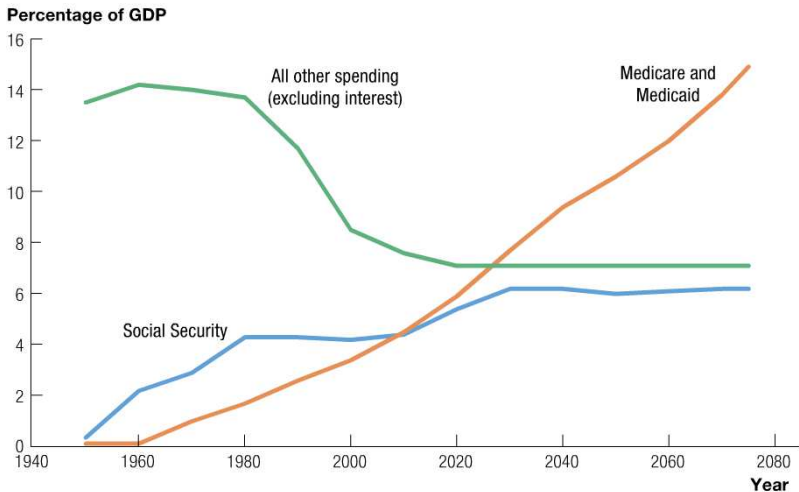Realized Output Gap vs. Fiscal Stimulus ($B)

The Fiscal Problem

of the 21st Century

Federal Spending and Revenue, 1950–2075

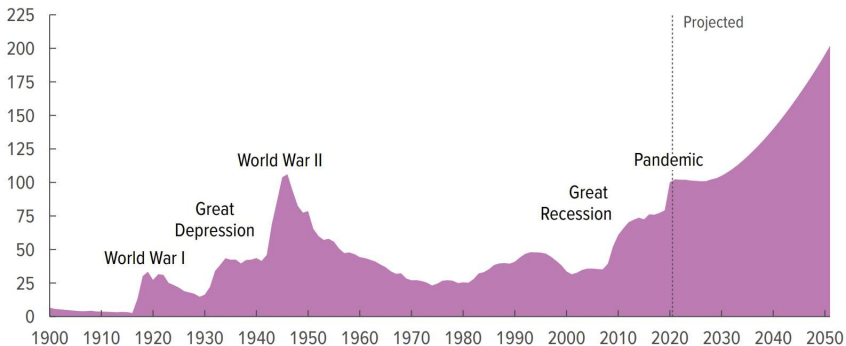Source: CBO 2002: "A 125-Year Picture of the Federal Government..."

Components of Federal Spending, 1950–2075

Percentage of GDP

All other spending (excluding interest)

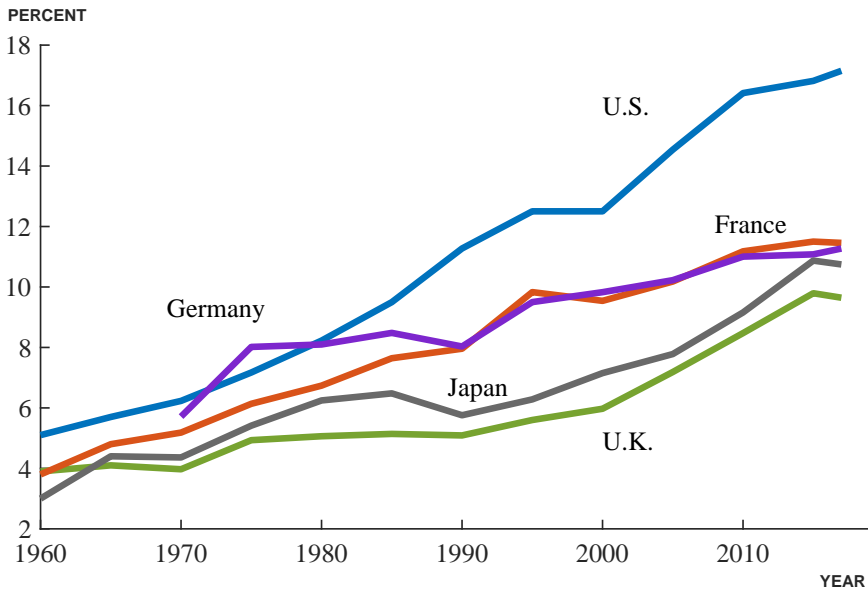Medicare and Medicaid

Social Security

Year

The Debt-GDP ratio in the future?

Percentage of Gross Domestic Product

Congressional Budget Office, March 2021

Health Spending as a Share of GDP around the World

PERCENT

U.S.

France

Germany

Japan

U.K.

YEAR

Why is health spending as a share of GDP growing?

- Joseph Newhouse (1992): New, expensive technologies

- But why are these being invented and used?

- One possible explanation (Hall and Jones, 2007)
  - Standard economics predicts that the health share should rise!

  - Diminishing returns to consumption on a given day
    - As we get richer, the extra utility from another car or TV declines — barely enough time to enjoy what we have.

  - Instead, what we need are more days of life to enjoy our high incomes...

- It may be optimal for health shares to head even higher!

How to finance higher health spending?

- Most health spending occurs toward the end of life.
  - Can we look forward and be disciplined enough to save 30% of our lifetime income for spending that may occur in 30 to 50 years?

- Who provides insurance?
  - Private insurance breaks down due to adverse selection, moral hazard
  - But financing ever rising health expenditures with taxes could be very costly
  - Mandate universal coverage at a basic level? Forced savings in health accounts used to finance better benefits?

- Issue is not just government debt... it's health expenditures

Putting it all together: Stopping a train

- Current fiscal policy is unsustainable

  - First order issue is health spending

  - Problems exacerbated by COVID crisis

- Crucial question: how does the train stop?

  - Orderly process? Requires politically difficult decisions.

  - Train wreck? What if the rest of the world becomes worried about the ability of the U.S. government to honor its real debts?

Discussion Question:

If you were the next Senator from California, how would
you propose to deal with the federal fiscal problems
of the coming decades?

Questions for Review

- What is the current U.S. fiscal situation?

- What is the government's budget constraint?

- In what sense does the government's budget have to balance?

- How much can the government borrow, and what are the dangers of borrowing "too much"?

- What is the "fiscal problem of the 21st century" and what are some possible solutions?

- Great data resource: http://usafacts.org/ (via Steve Ballmer)