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Session 15: The Government and the Macroeconomy

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Stanford GSB

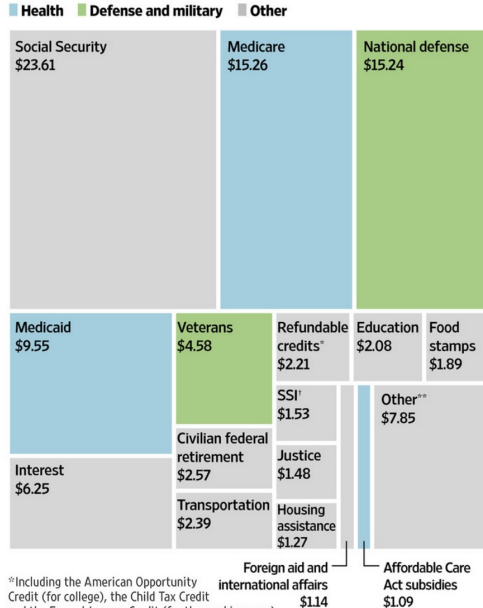
Outline: The Government and the Macroeconomy

- 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
- Regulation and taxation

The U.S. Federal Budget for 2022 (estimated)

	% of GDP	\$/Person
Total Expenditures	24.0	17,600
Health (including Medicare)	6.7	4,900
Social security	5.0	3,700
National defense	3.2	2,300
Income security	3.8	2,800
Net interest	1.5	1,100
Total Revenues	18.2	13,300
Individual income taxes	9.3	6,800
Social insurance and retirement receipts	5.9	4,300
Corporation income taxes	1.6	1,200
Budget Deficit	5.8	4,300

Allocation of \$100 paid in federal taxes for 2016

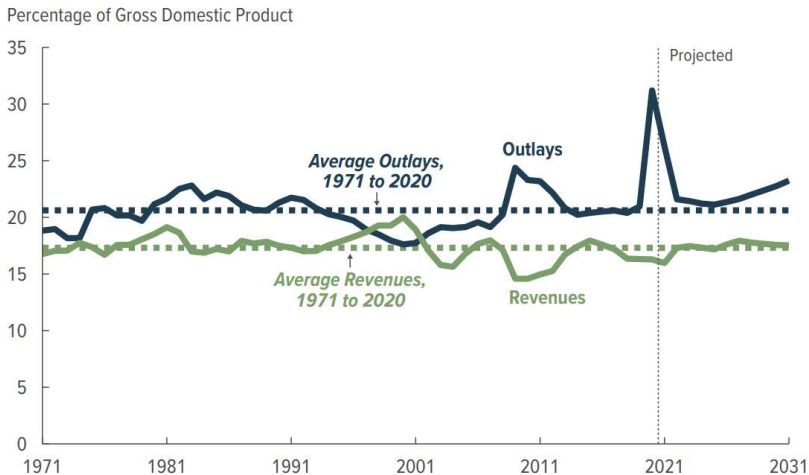


What does the U.S. government do?

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

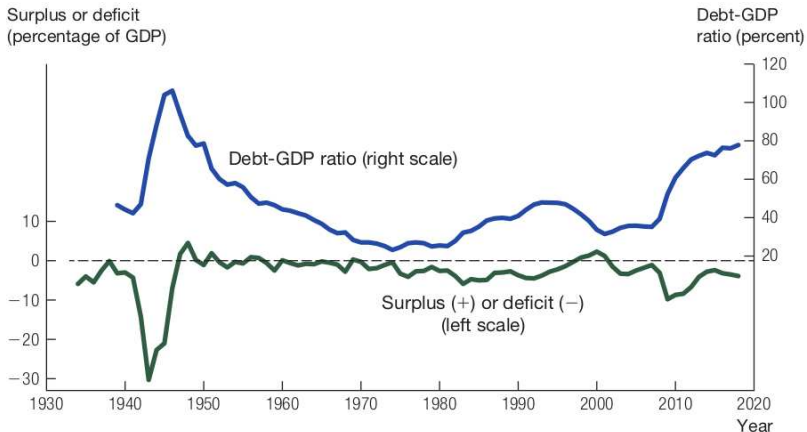
— *Paul Krugman*

U.S. Federal Spending and Revenue



Congressional Budget Office, March 2021

Federal Debt and Deficits in the U.S.



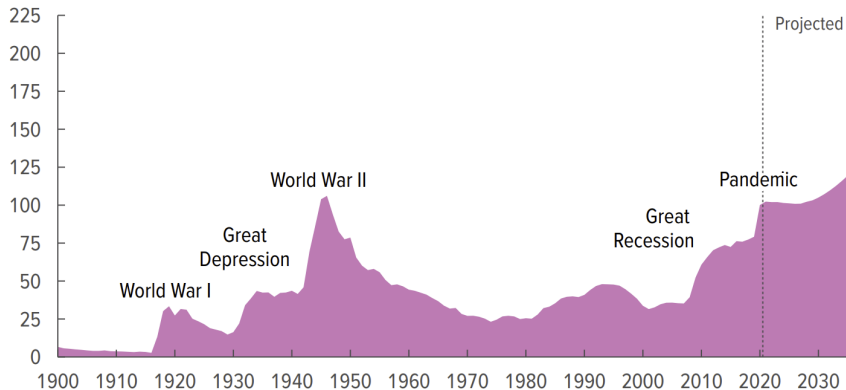
Debt in 2021 = \$23.2 trillion

Debt/GDP in 2021 = 95.0%, or \$70,000 per person

This is net. Gross Debt/GDP is 121%

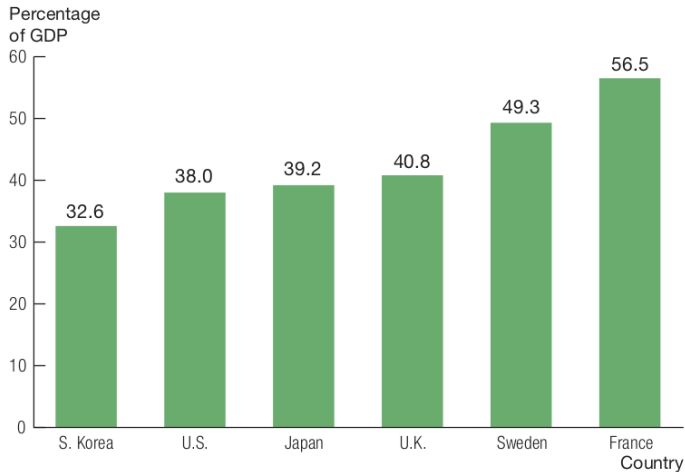
Federal Debt/GDP Historically

Percentage of Gross Domestic Product

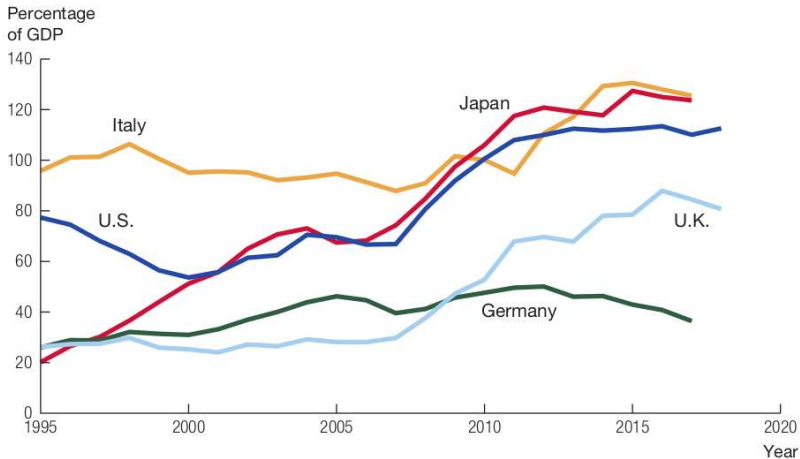


Congressional Budget Office, March 2021

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: $B_3 = 0$

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

$$\underbrace{(T_1 - G_1)}_{\text{surplus today}} + \underbrace{\frac{(T_2 - G_2)}{1+i}}_{\text{future surplus}} = \underbrace{(1+i)B_1}_{\text{initial debt}}$$

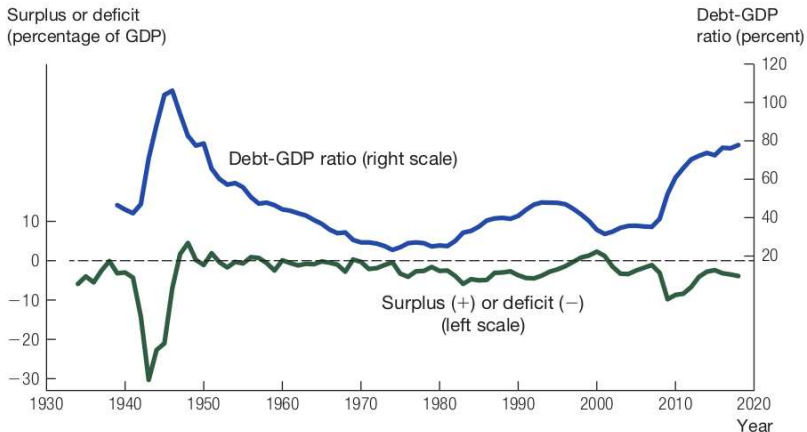
The Lesson of Budget Constraints

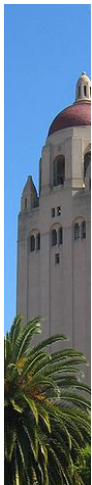
Budgets must balance, not period by period, but in present discounted value.

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

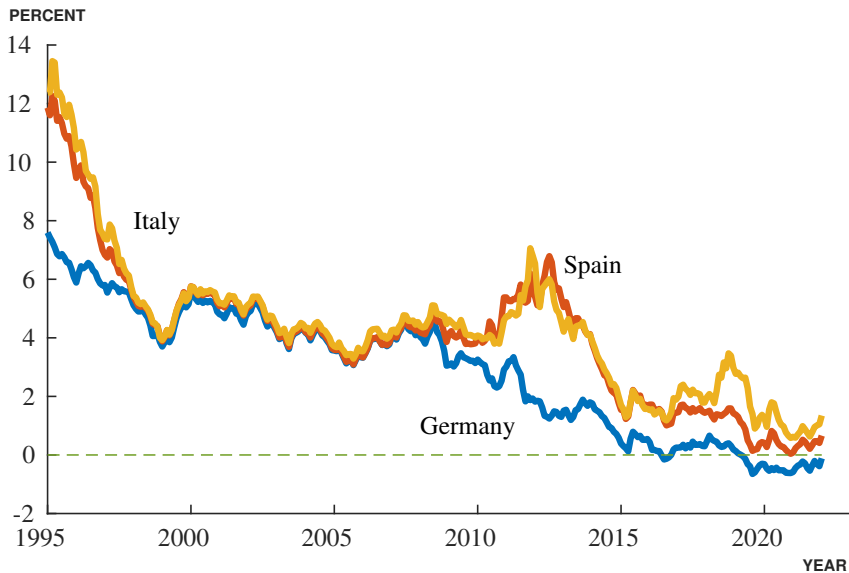
How did the U.S. reduce WWII debt?



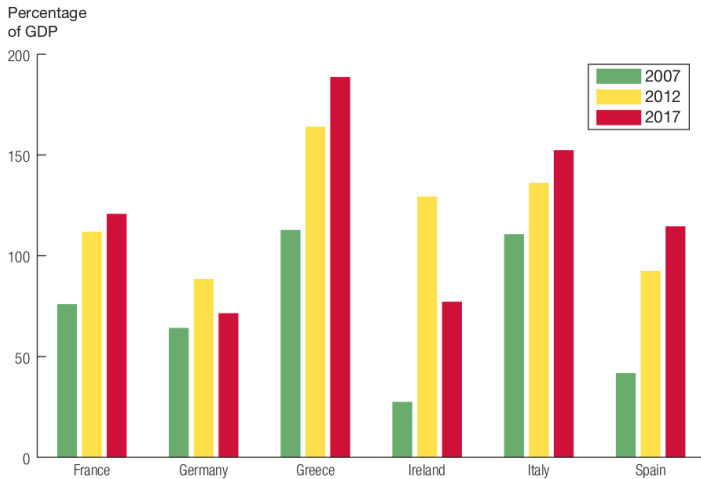


The Eurozone Crisis

10-Year Government Bond Yields



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

- 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
 - but more importantly...

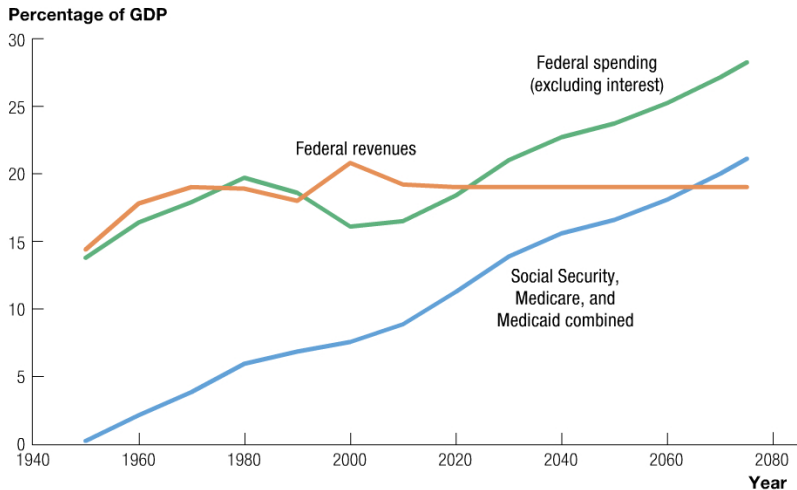
“Within our mandate, the ECB is ready to do whatever it takes to preserve the euro, [...] believe me, it will be enough.”

— Mario Draghi, President of the ECB July 2012



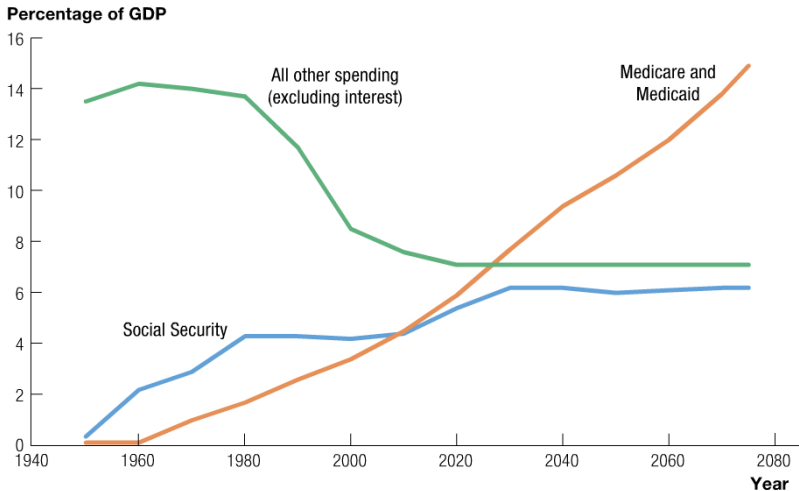
The Fiscal Problem of the 21st Century

Federal Spending and Revenue, 1950–2075



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

Components of Federal Spending, 1950–2075

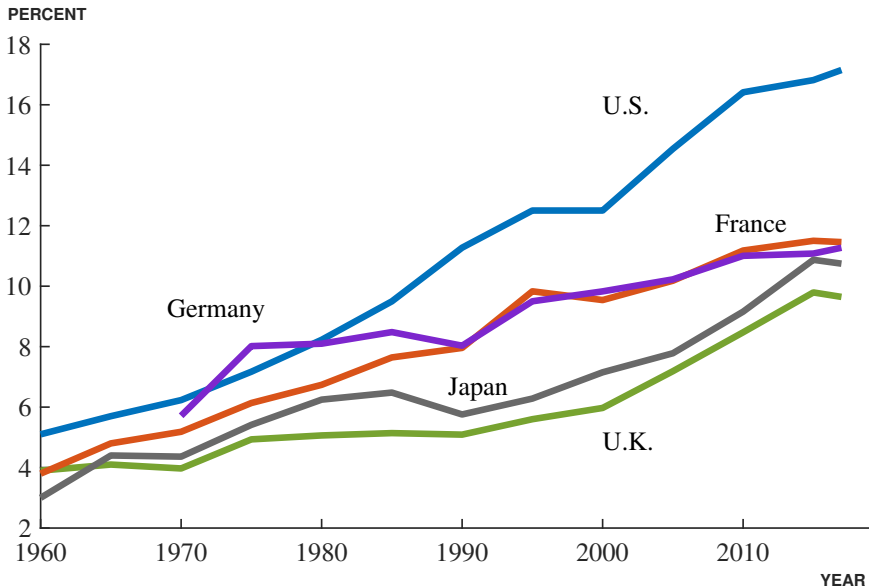


The Debt-GDP ratio in the future?



Congressional Budget Office, March 2021

Health Spending as a Share of GDP around the World



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?



Government Regulation and Taxation

Discussion: Government and Regulation

- **Reading:** Ted Nordhaus on “Deregulation and Clean Energy”

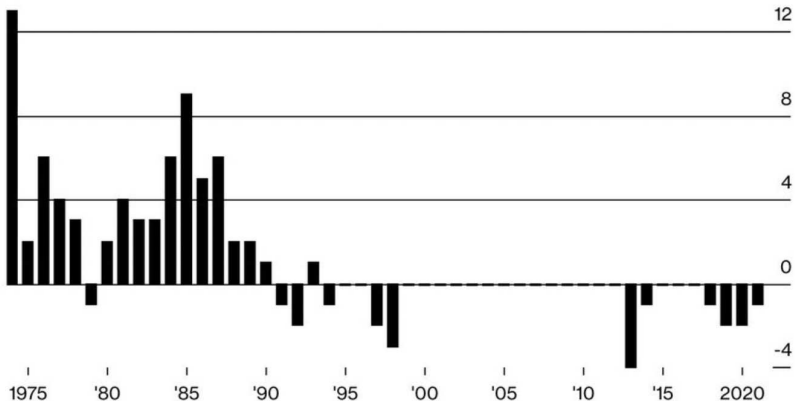
Discussion: Government and Regulation

- **Reading:** Ted Nordhaus on “Deregulation and Clean Energy”
 - Merely completing environmental impact statement for infrastructure projects takes 5 years
 - For solar/wind, U.S. needs to triple electricity transmission infrastructure; zero major lines built in past decades
 - Since founded in 1975, the Nuclear Regulatory Commission has never licensed a new commercial nuclear reactor design that was subsequently built
 - UNCOORDINATED TOLLBOOTHS???

Nuclear power in the U.S.

U.S. Nuclear Facilities

Annual change in the number of reactors in the U.S.

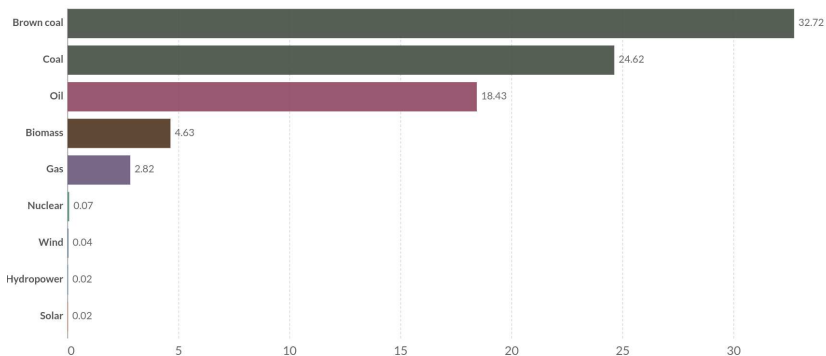


Safety?

Death rates from energy production per TWh

Death rates are measured based on deaths from accidents and air pollution per terawatt-hour (TWh).

Our World
in Data



Source: Markandya & Wilkinson (2007); Sovacool et al. (2016)

OurWorldInData.org/energy • CC BY

Other Examples

- Regulation is often a hidden tax on economic activity (doesn't appear in spending or taxes)
- Why are there no skyscrapers on Sand Hill Road? Why are cows and horses grazing nearby?
- Competition is a great disinfectant, let's have more
 - Why don't high schools have to compete for students' share of government funding?
 - You see the prices of almost everything you buy, but not in health care.
 - Monopoly restrictions sabotage low-cost competition (e.g. occupational licensing)

Government Spending and Taxation

- **Good:** Taxes raise revenue to pay for valuable things
 - Property rights, rule of law
 - Education, clean air, social insurance, defense
 - Basic research
- **Bad:** Taxes reduce the “size of the pie” (distort incentives)
 - Taxes reduce work and investment
 - Entrepreneurs create fewer ideas
(Akcigit et al “[Taxation and Innovation in the 20th Century](#)”)
- Cost of government spending is the alternative use for the resources
 - Instead of aircraft carriers we can build more houses
 - Instead of high-speed trains we can have longer vacations
 - Spending vs. transfers

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)