The Global Economy

Fiscal Policy + Balance of Payments

NYU STERN

Agenda

- Review Session: Dec 10: 12pm-12:45pm
  - Email questions by Thursday, Dec 8
  - Do not include questions from practice final
- Tax and Fiscal Policy
- Balance of Payments (introduction)

Using and Interpreting Regressions

- R^2 – "goodness of fit" measure
  - Share of variance of dependent variable explained by regression
- Standard error of regression
  - If errors are normally distributed, provides a confidence interval around fitted or forecast value (one-SD bandwidth = 68%; two-SD bandwidth = 95%)
- Coefficients
  - Sensitivity of dependent variable to independent variables; used in calculating forecast based on observed independent variables
- Standard error of coefficient
  - If errors are normally distributed, provides a confidence interval around coefficient (one-SD bandwidth = 68%; two-SD bandwidth = 95%)
- t-statistic
  - Measures ratio of coefficient to its standard error; tests hypothesis that coefficient is different from zero (95% confidence interval when t>1.96)

Fiscal Policy Roadmap

- What should governments do?
- Theory of taxation
- Theory of debts and deficits
- Issues in the U.S.
  - Social Security
  - Medicare/Medicaid

What should governments do? I

- Provide *public goods*
- Public goods are hard for markets to supply
  - Non excludable: hard to keep people from consuming it
    - Fish in the ocean, radio/tv/comms spectrum, fireworks
  - Non rival: my consumption does not affect your consumption
    - T.V. (cable and broadcast), fresh air, NY skyline
- Hard for a private firm to capture all the benefits of these goods, so market would provide too little
- Public goods governments may provide
  - National defense, environmental protection, police, fire

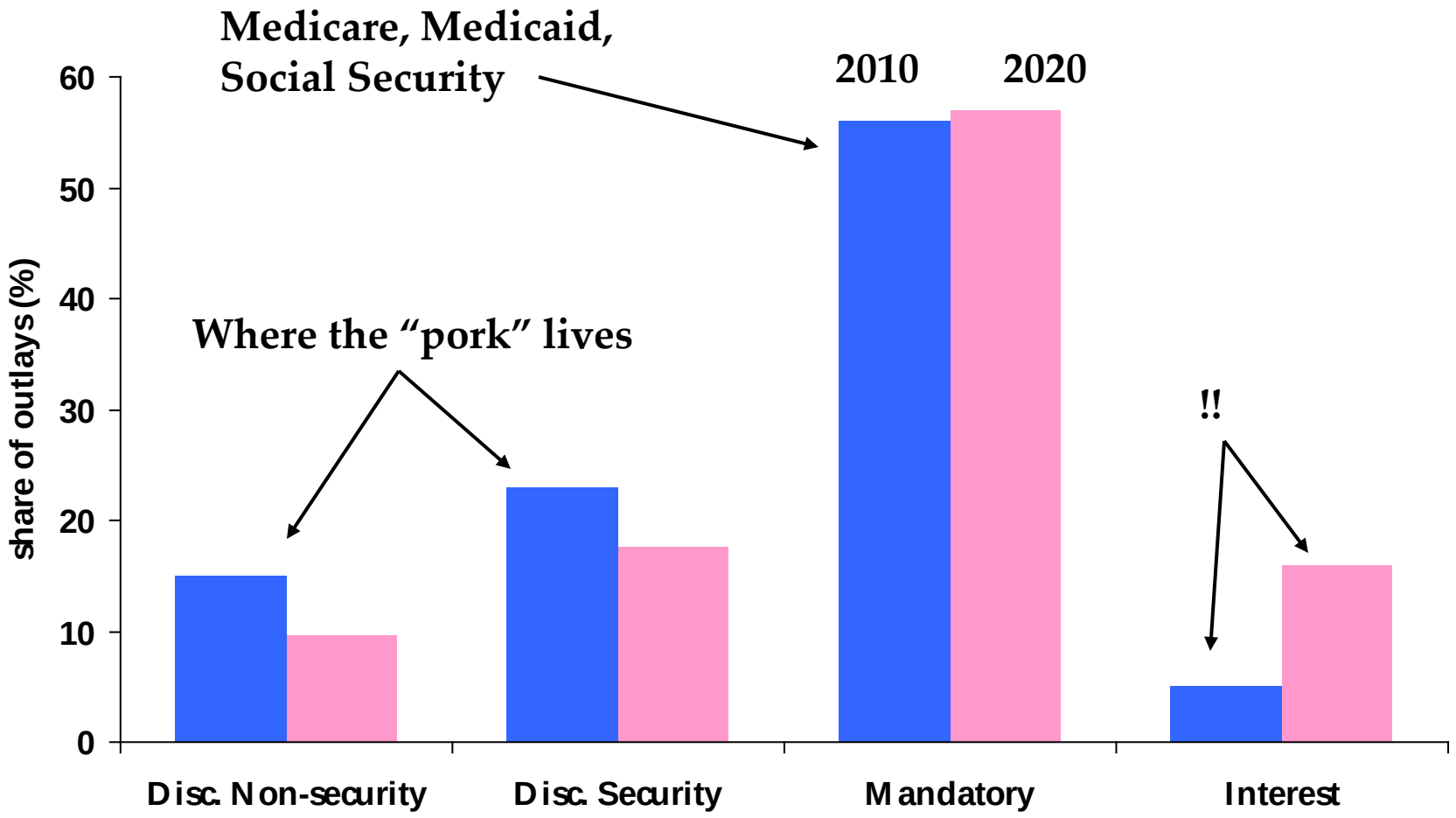
What should governments do? I

- Most goods are not completely public and society has to make choices about what to provide and what not to.
- People have different opinions on this.
  - Sports stadiums?
  - Mass transit?
  - Subsidies to home ownership?
  - Economic data?

What should governments do? II

- Provide *insurance and redistribution*
- Protect the unfortunate
  - Disability insurance, medical programs
  - People who save too little: social security
- Theory
  - Rawls' "Veil of Ignorance"
  - Market failure: adverse selection, moral hazard
- These are large programs in many countries

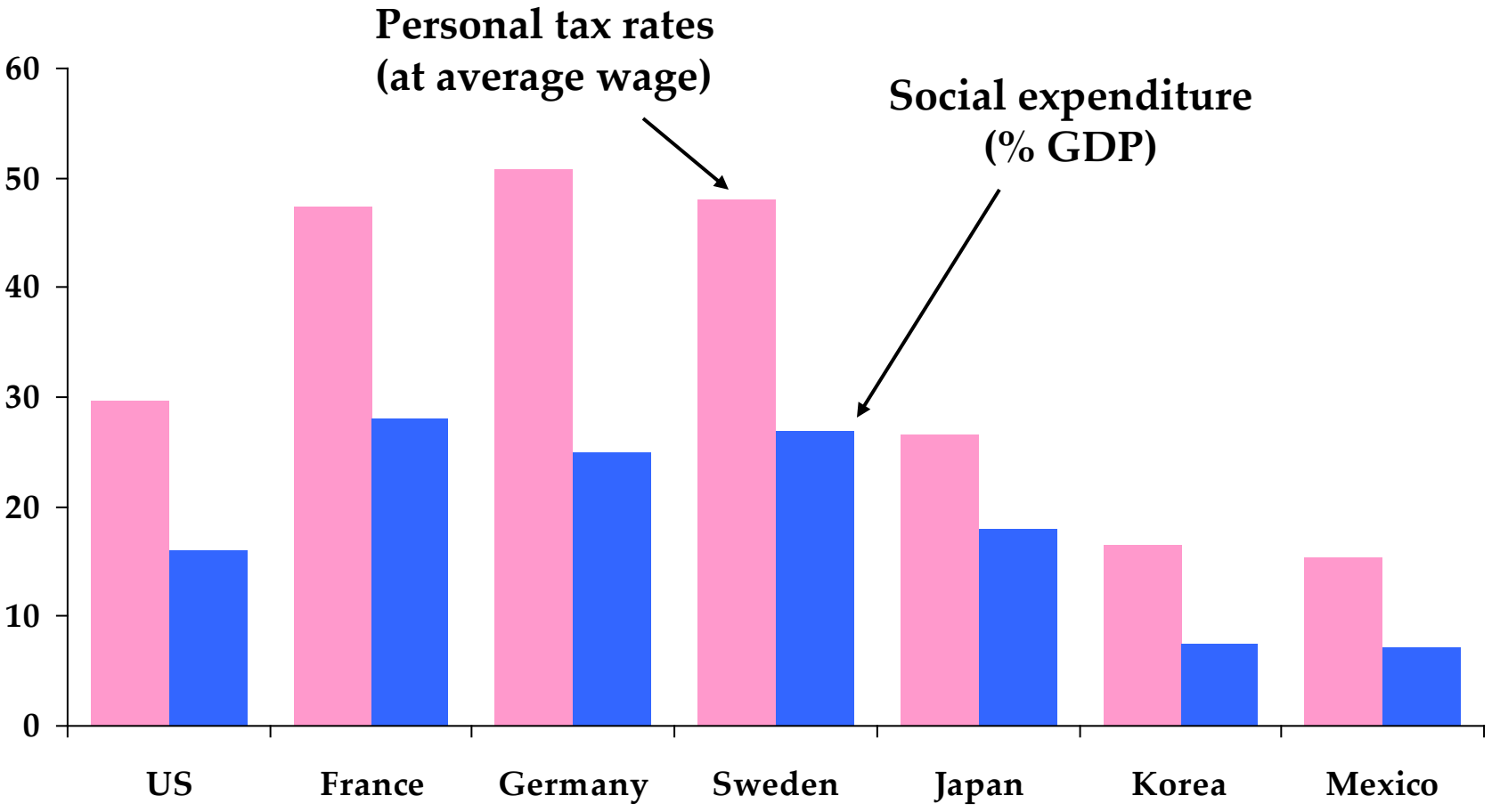
U.S. Budget Outlays



What should governments do?

- Insurance concerns make up large shares of government budgets
- How much insurance?
  - A lot of variation across countries
  - Economists don't have great answers to this question (see Glaeser blog in NYT)
- In general, larger insurance programs have to be paid for by higher taxes (more on this later)
  - Economists do have something to say here

Social insurance and taxes across countries



Taxes: theory

- Societies choose different levels of spending on goods, services, and insurance
- But all countries have to pay for these expenditures, usually through taxation
- Taxes differ across countries
  - High tax rates reflect high gov't spending
- What does "good" tax policy look like?
  - Keep distortions low
  - Try not to ruin incentives

Taxes

- *Distortionary taxes:* **common**
  - Proportional to value (*ad valorem* tax)
  - Per-unit tax (specific tax)
  - Income tax, sales tax, sin tax

Distortionary taxes

- Creates a wedge (distortion) between real price and the price paid

$$price\ paid = \left(1+\tau\right) \times price$$

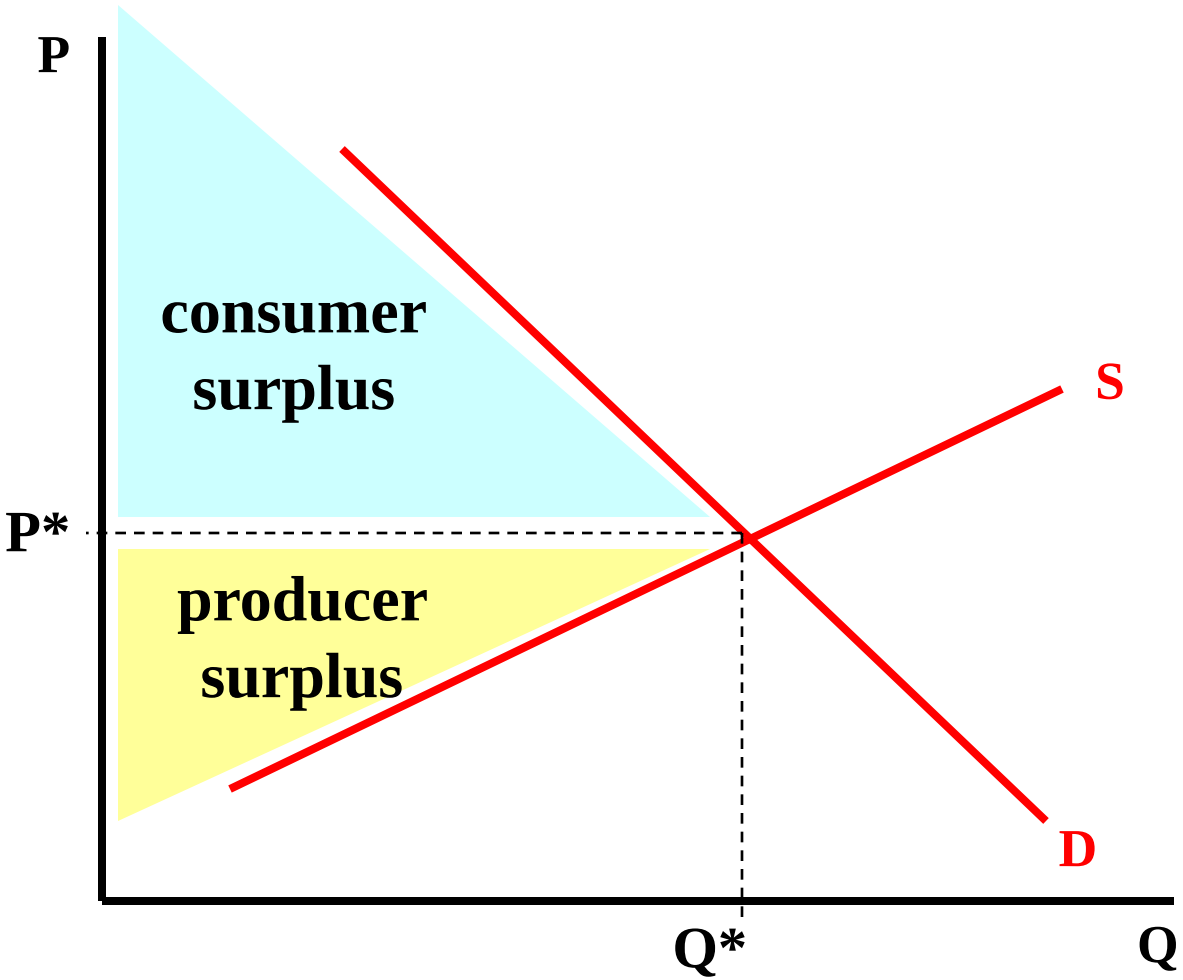
- If tax rates differ across goods, distorts relative prices (sometimes on purpose)

$$\frac{price\ paid\ cigarettes}{price\ paid\ broccoli} = \frac{\left(1+\tau_{cig}\right)}{\left(1+\tau_{broc}\right)} \times \frac{price\ cigarettes}{price\ broccoli}$$

Distortionary taxation

- Taxes create distortions
  - Break the link between producer costs and consumer willingness to pay
  - Diminishes the efficiency of the market
- To minimize distortions
  - Tax a broad base at a low rate

Measuring welfare



A distortionary tax

- Charge a per unit tax of t dollars

$$price = p + t$$

- Does it matter who "pays" the tax?

A distortionary tax

- Charge a per unit tax of t dollars

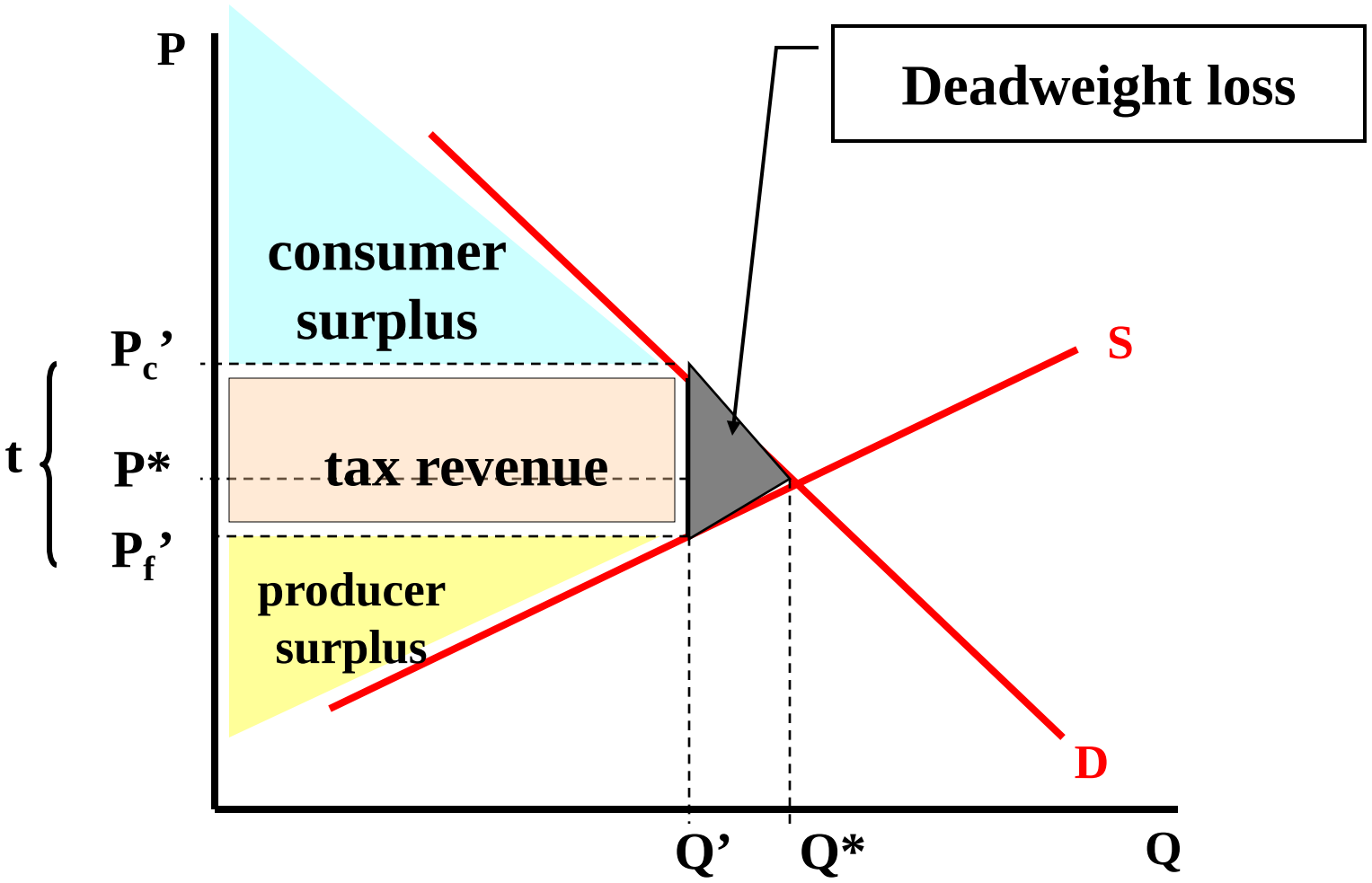
$$price = p + t$$

- Price received by producer plus tax is price paid by consumer

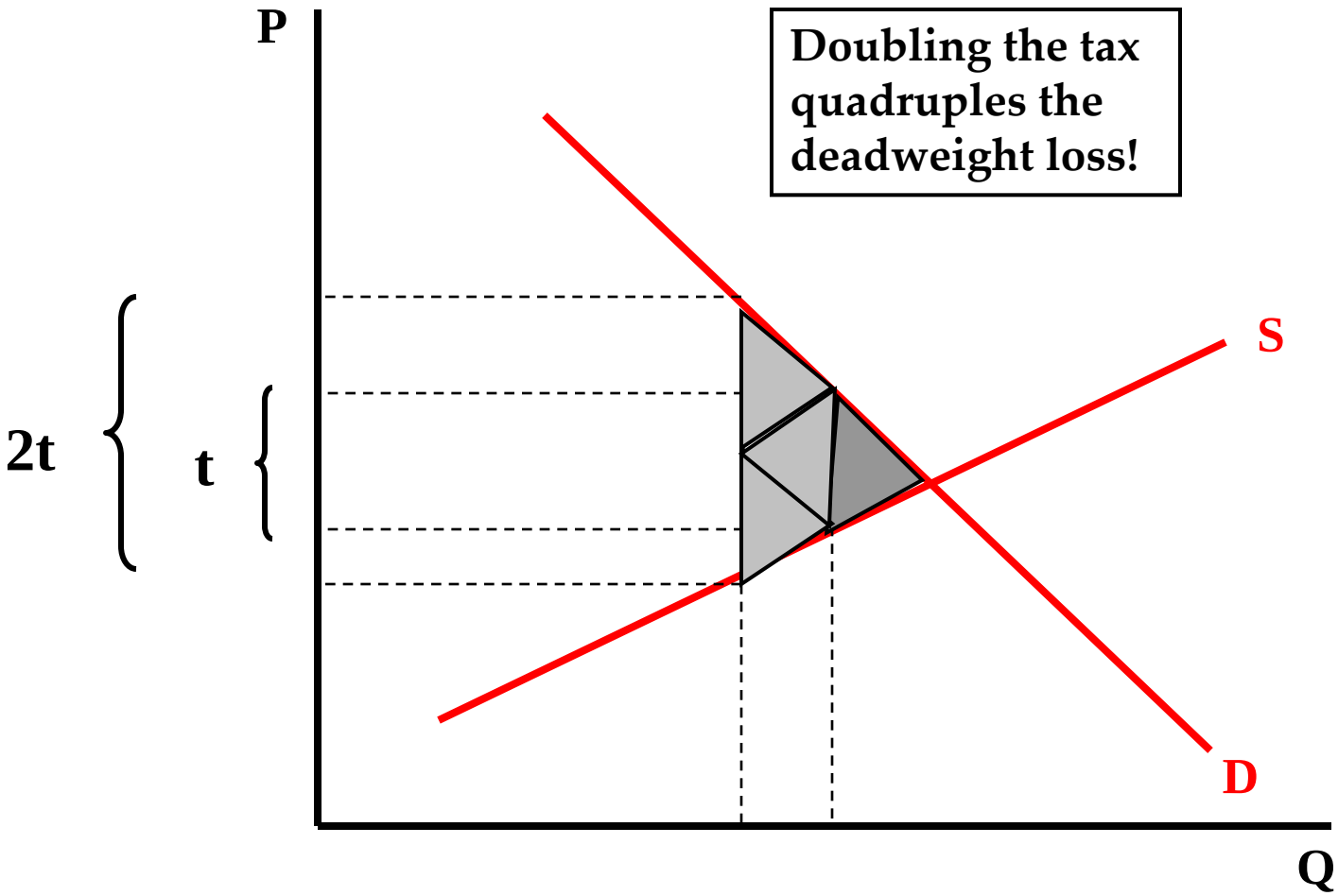
$$p_f + t = p_c$$

- Deadweight loss = loss of surplus not made up for by tax revenue
  - Sales that would have created surplus, but are not transacted at the new, higher, price

Taxes destroy surplus



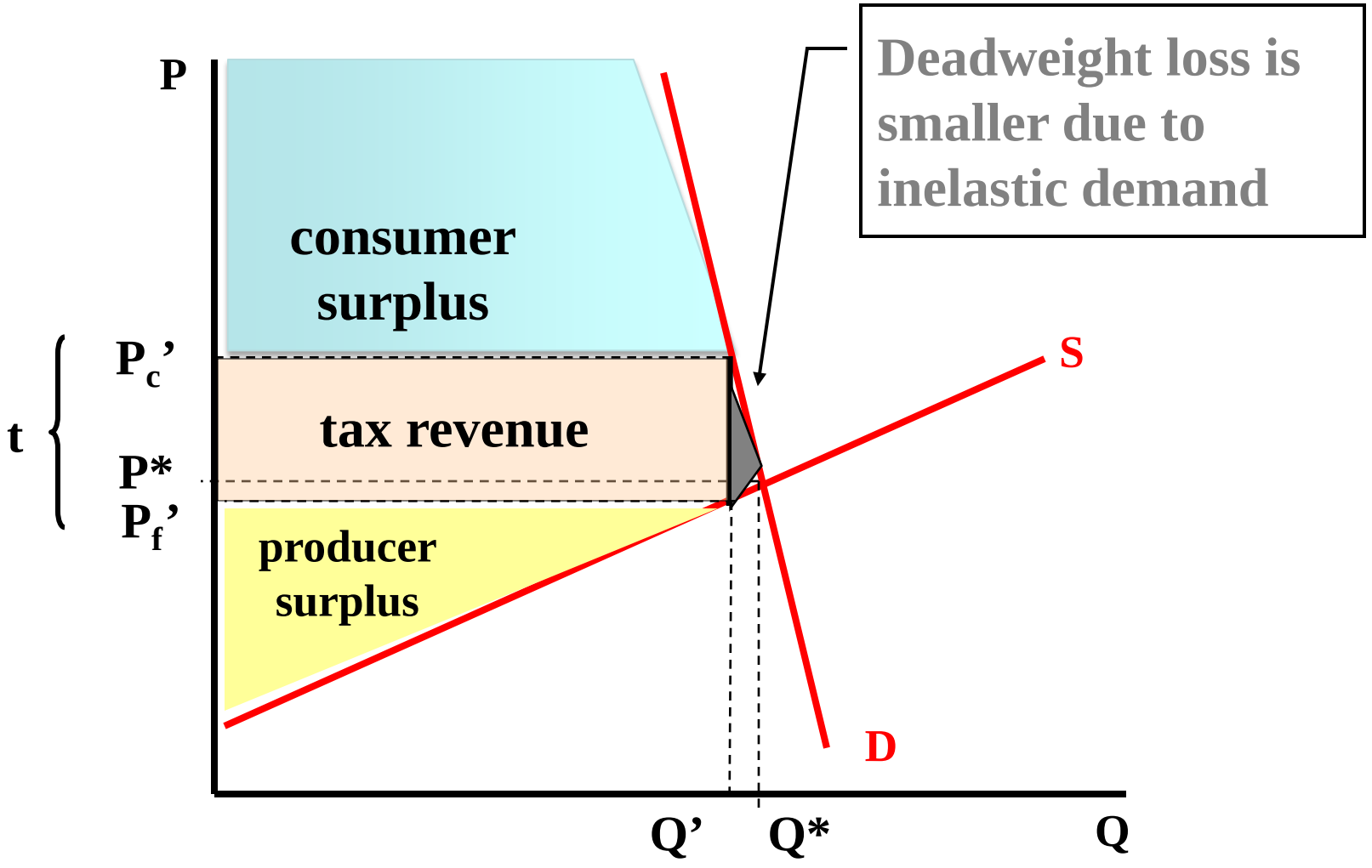
Larger taxes destroy more surplus!



The deadweight loss

- What determines the size of the deadweight loss?
- Slope of supply and demand curves
  - Economists refer to *price elasticity of demand and supply*
  - High elasticity = flatter slope
  - Low elasticity = steep slope
  - Cigarettes? Potatoes? Gasoline? Pepsi?
- What kind of goods should be taxed?

Inelasticity reduces deadweight loss



Distortionary taxes summary

- Distortions grow faster than the tax rate
  - Decrease the efficiency of markets
- To minimize distortions
  - Small taxes
  - Large base
  - Low elasticity goods: smaller deadweight losses, but low elasticity goods tend to be necessities (fuel, food, etc) so these taxes may be regressive

Debt and deficits: theory

- Government budget constraint:

$$G_t + V_t + i_t B_t = T_t + B_{t+1} - B_t$$

- Ingredients:
  - G = government purchases of goods and services
  - V = transfer payments from government to households
  - G + V = government spending
  - T = tax revenue
  - D = G + V – T = *primary* deficit (excl interest)
  - B = government debt ("bonds")
  - i = (nominal) interest rate paid on debt
  - iB = interest payments

How should a deficit be financed?

- Government budget constraint:

$$G_t + V_t + i_t B_t = T_t + B_{t+1} - B_t$$

- If $G_t + V_t + i_t B_t - T_t > 0$
  - Raise taxes: increase T_t
  - Issue debt: increase B_{t+1}
- Is there a difference?

How should a deficit be financed?

- Government budget constraint:

$$G_t + V_t + i_t B_t = T_t + B_{t+1} - B_t$$

- Rewrite as

$$B_t(1+i_t) = B_{t+1} + T_t - G_t - V_t$$

$$B_t(1+i_t) = B_{t+1} - D_t$$

$$B_t = \frac{B_{t+1}}{1+i_t} - \frac{D_t}{1+i_t}$$

- Debt today is PV of tomorrow's debt + tomorrow's primary surplus

Taxes and debt: present value

- Repeated substitution gives us

$$B_t = \frac{B_{t+n}}{(1+i)^n} - \left[\frac{D_t}{1+i} + \frac{D_{t+1}}{(1+i)^2} + \ldots + \frac{D_{t+n-1}}{(1+i)^n} \right]$$

$$= \text{present value of future primary surpluses}$$

- Debt is financed by future surpluses
  - Assumes $B_{t+n} \Big/ (1+i)^n \to 0$
  - Don't need $B_{t+n} \to 0$

Pay me now, or pay me later

- Spending must be financed by tax revenues
  - Tax revenues now
  - Or tax revenues later (with interest!)
- Debt allows governments to
  - Keep tax rates from fluctuating
  - Transfer today's spending to tomorrow's taxpayers

Sustainability analysis

- Issue:
  - What happens to ratio of debt to GDP if policy doesn't change?
  - If it decreases/constant, it is sustainable. If not, unsustainable.
  - Both measured at current prices ("nominal")
- Growth of (nominal) debt

$$[1] \qquad B_{t+1} = (1+i)B_t + D_t$$

- Growth of (nominal) GDP

$$[2] \qquad Y_{t+1} = (1+g)Y_t$$

- Growth of debt to GDP ratio (divide [1] by [2])

$$[3] \qquad \frac{B_{t+1}}{Y_{t+1}} = \frac{1+i}{1+g}\frac{B_t}{Y_t} + \frac{1}{1+g}\frac{D_t}{Y_t}$$

Sustainability analysis

- With a balanced budget …
  - Ratio of debt to GDP grows at: $\frac{1+i}{1+g}$
- … sustainability requires

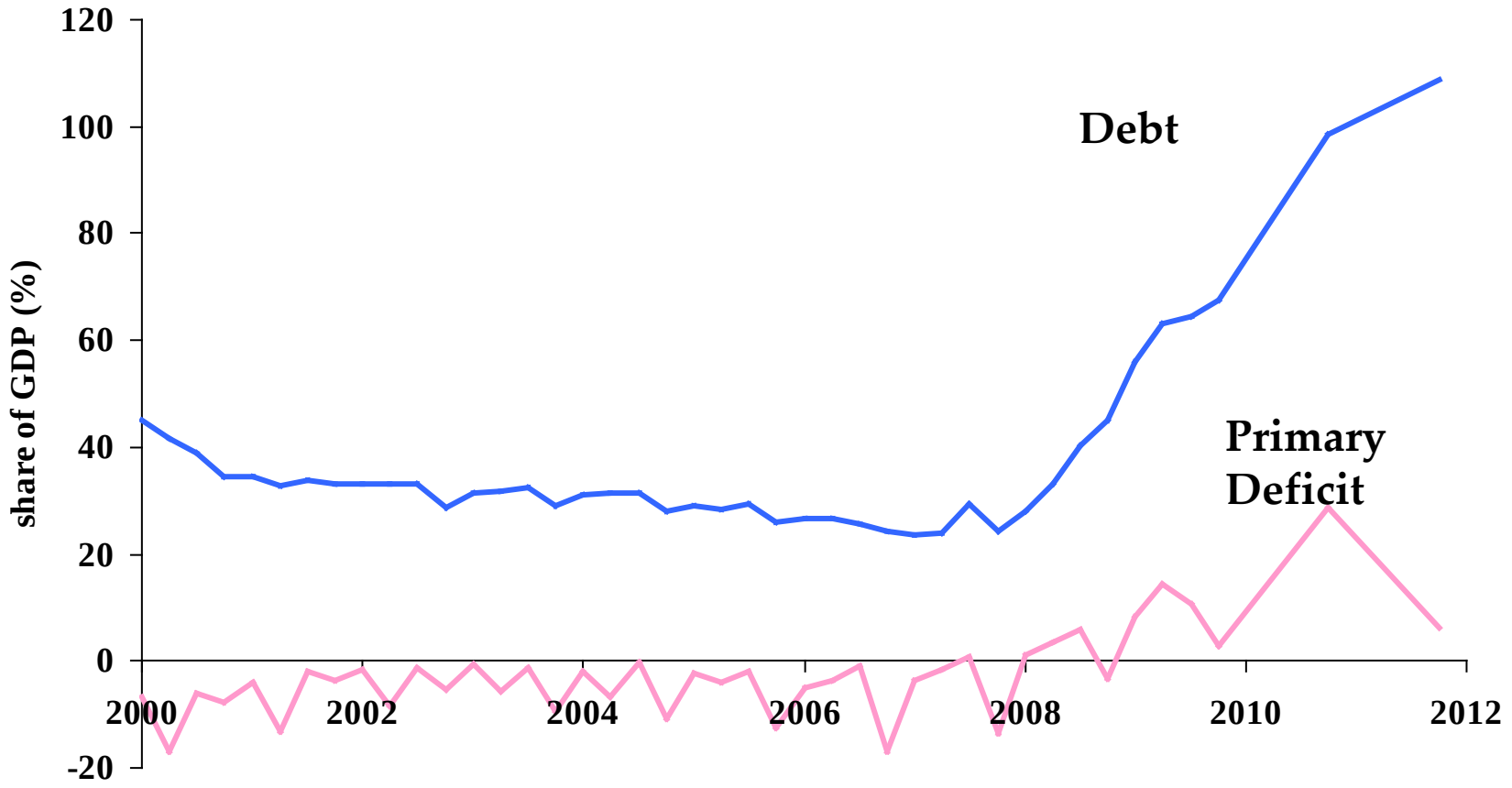
$$\frac{1+i}{1+g} < 1 \quad \text{or} \quad i < g$$

- Typically, however, $i > g$
  - Even with a balanced budget, debt load is too big
  - Therefore something must change – but what?

Sustainability analysis

- "Unsustainable" means something must change
  - Start running surpluses: more tax revenue and/or less spending
  - Faster GDP growth: real – not a policy choice
  - Faster GDP growth: nominal – inflate your problems away!
  - Default on debt

Debt and deficits in Ireland



Fiscal policy in Ireland 2011

Primary deficit (% GDP)	6.2
Interest on debt (%)	5.4
Inflation rate (%)	-0.7
Real GDP growth rate (%)	1.2
Public debt (% GDP, end of 2010)	98.5

Is debt increasing or decreasing?

Ireland 2011

$$\frac{B_{2012}}{Y_{2012}} = \frac{1+i}{1+g}\frac{B_{2011}}{Y_{2011}} + \frac{1}{1+g}\frac{D_{2011}}{Y_{2011}}$$

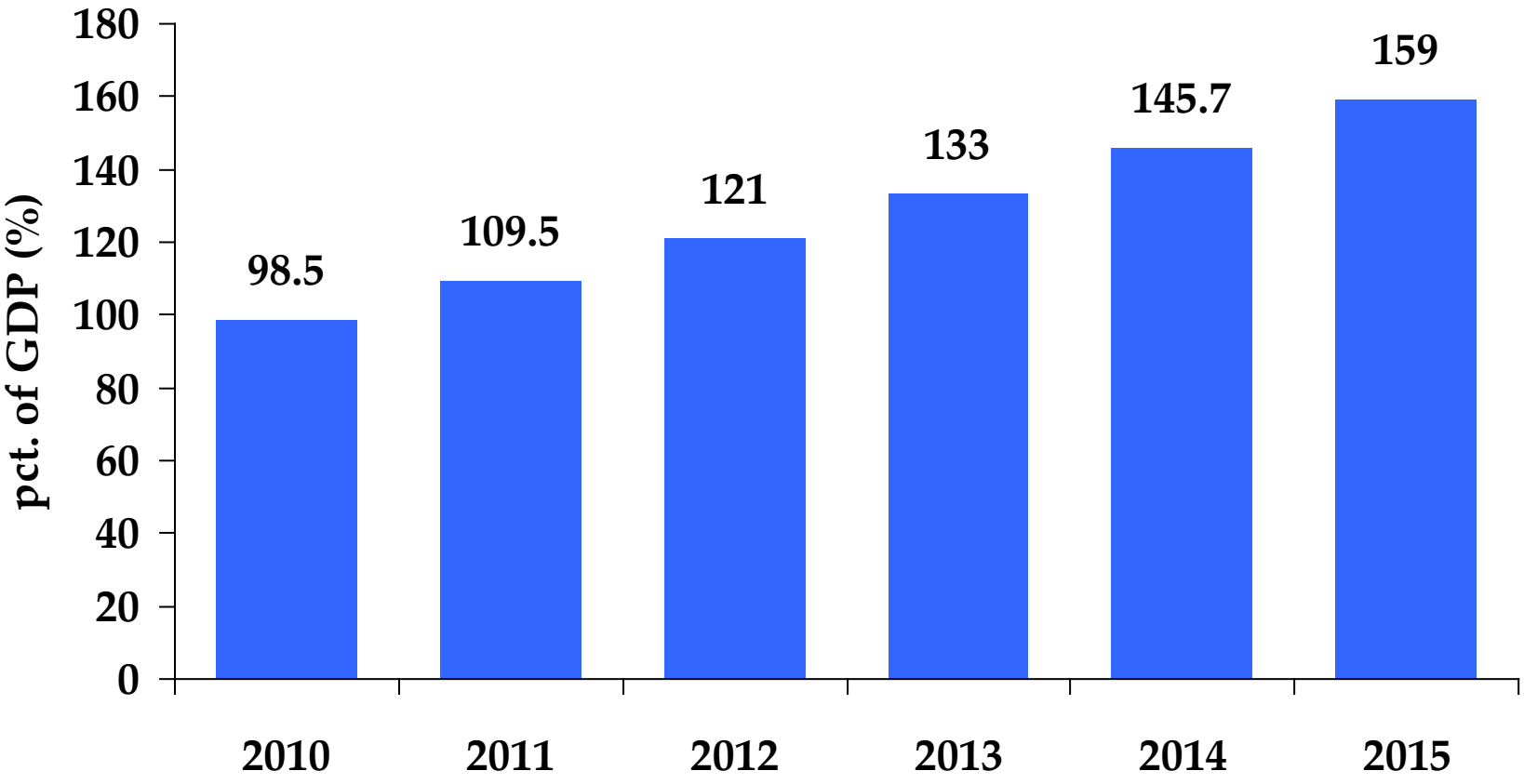
$$\frac{B_{2012}}{Y_{2012}} = \frac{1+0.054}{1+0.012-0.007}98.5 + \frac{1}{1+0.012-0.007}6.2$$

$$\frac{B_{2012}}{Y_{2012}} = 103.3 + 6.2 = 109.5$$

- Note: Debt is reported at the end of year *t*, but is identical at the start of year *t+1*. The debt numbers in the equations above are at the start of the year.
- Check at home: what is debt at the end of 2012 if the primary deficit, nominal GDP growth rate, and interest rate stay constant?

Ireland Debt Simulation

Constant Policy, Growth, Interest Rate



Choices: Ireland

- "Unsustainable" means something must change
  - Start running surpluses: more tax revenue and/or less spending
  - Faster GDP growth: nominal – inflate your problems away!
  - Default on debt

Painful!

Euro eliminates this choice!

Will other euro countries let this happen?

Fiscal policy in US

- What are the long-term budget issues?
- Explicit debt: contracts with others
  - Legal liability, pay or default
  - Bonds, bills, etc
- Implicit debt: legislation that mandates future payments,
  - Government can change these payments "at will"
  - Social Security, Medicare, Medicaid

How big are US debts?

- 2010 U.S. debt held by the public
  - Bonds, bills = $9 trillion
- 2010 unfunded liabilities (present value)
  - Social Security (OASDI) = $16 trillion
  - Medicare = $36 trillion
- Nominal GDP in 2010 about $15 trillion
- Debt-to-GDP ratio
  - Explicit = 9/15 =60%
  - **Implicit = (16+36)/15=350%**

Social Security

- Old Age and Survivors Insurance (OASI) and Disability Insurance (DI)
- Funded by 12.4% payroll tax
  - The employer "pays" half the tax
  - But we know it doesn't matter who "pays!"
- System is "pay as you go"
  - Current workers finance current retirees
- Initial level of benefits + cost of living adjustments

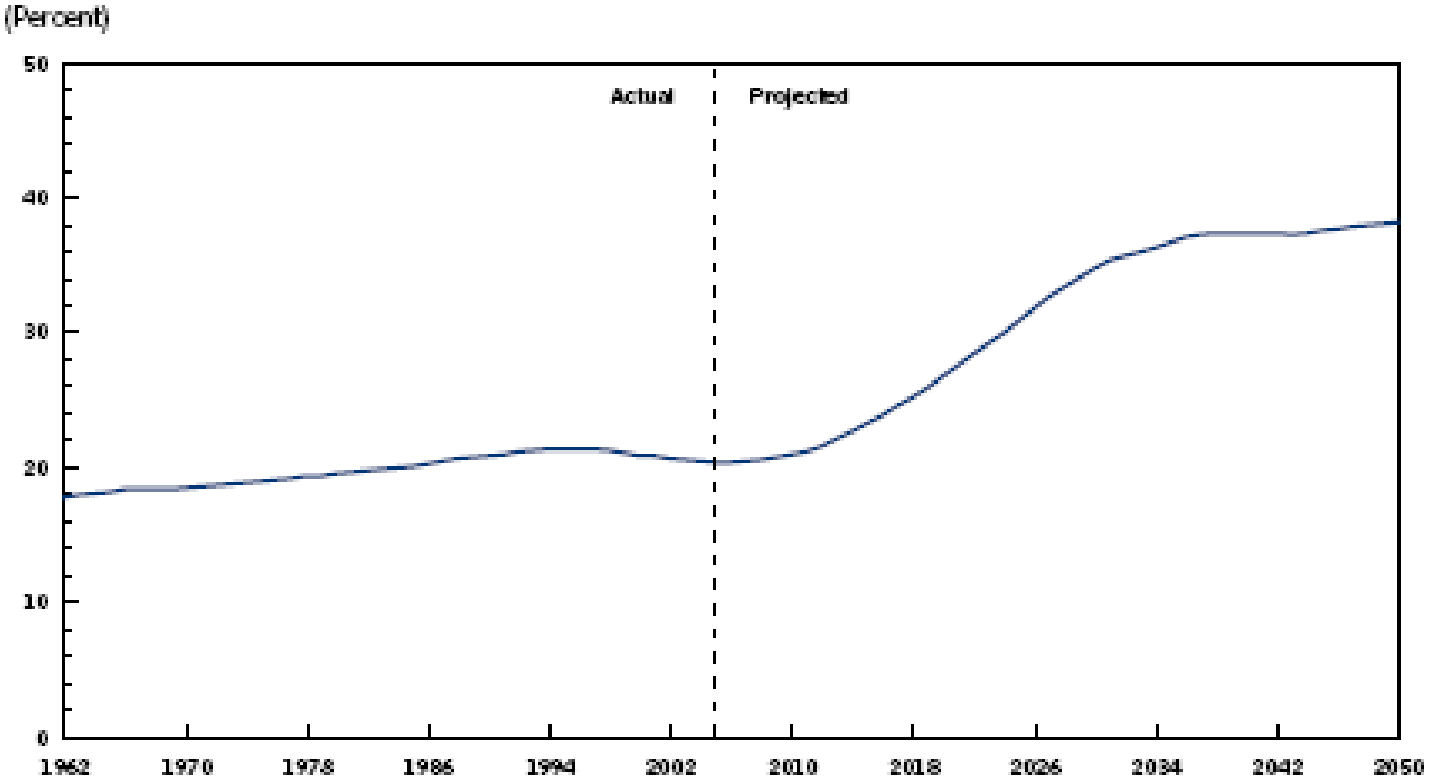
Social Security problems

- Pay-as-you-go meets the baby boomers
  - Ageing population means fewer workers paying taxes to support each retiree
  - 1983 reform: changed system to accumulate surplus to cover baby boomers retiring.
  - Surpluses accumulated in the social security trust fund
  - Trust fund, however, is not large enough to keep the system funded

Demographics

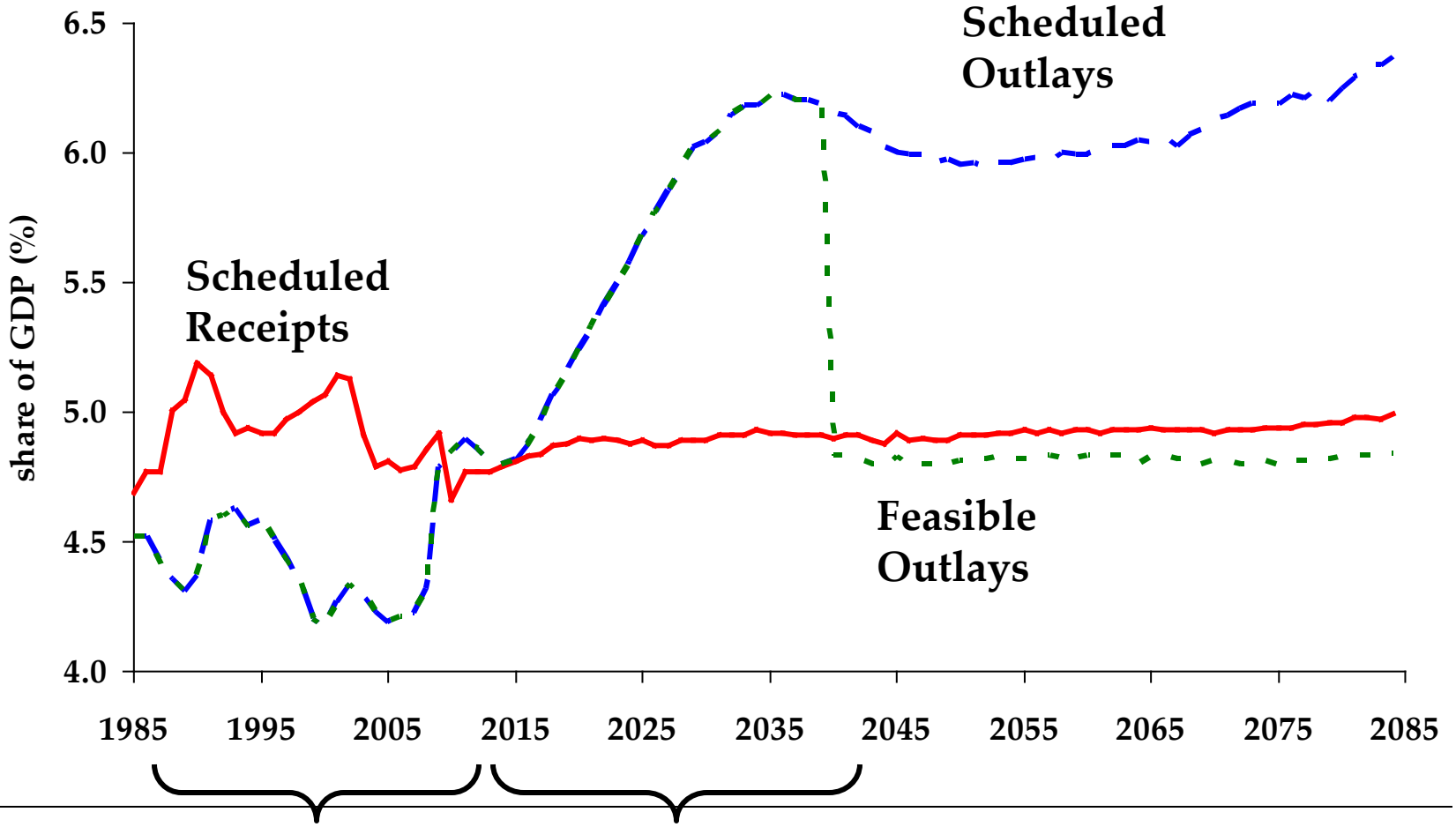
Figure 2-2.

The Population Age 65 or Older as a Percentage of the Population Ages 20 to 64



Source: Congressional Budget Office.

Social Security outlays and receipts



Social Security fixes

- Economist: solutions are "simple"
  - Increase the payroll tax (need about 2% more)
  - Reduce initial level of benefits
  - Increase retirement age
  - Reduce cost-of-living adjustments
- Society/politicians: no, they are not!
- Congressional Budget Office analysis (2010)
  - http://www.cbo.gov/doc.cfm?index=11580

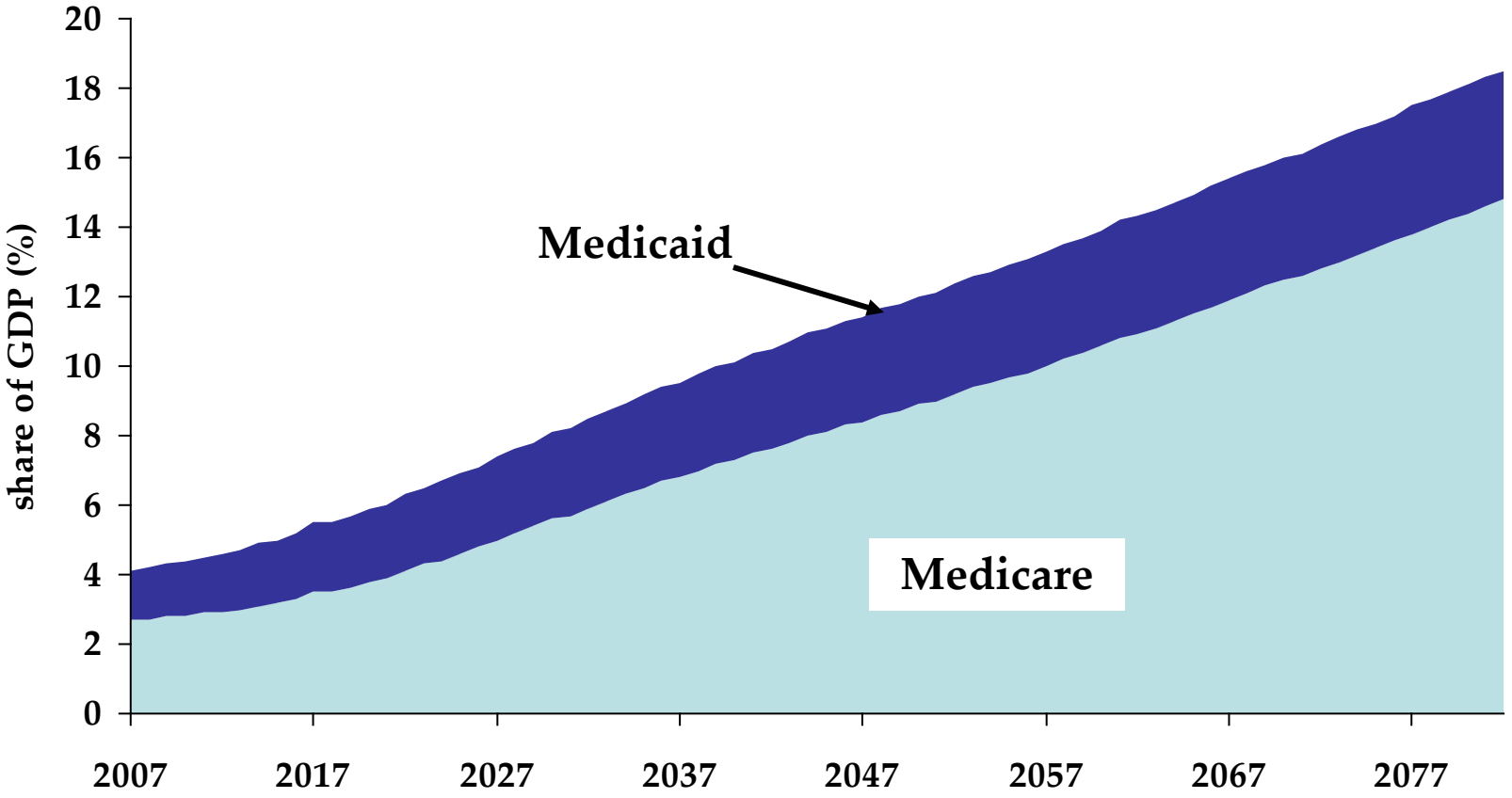
Medicare and Medicaid

- Medicare: age 65 and older
  - When enacted: 50% of elderly had insurance
  - Parts A&B cover hospital and physician care
  - Part D (2006) covers drugs
  - Funded by payroll tax and general revenues
- Medicaid: poor (joint state-federal program)
  - Federal government share about 57%
  - States set rules, but generally low income-low wealth populations
  - Many enrollees are children

Medicare and Medicaid problems

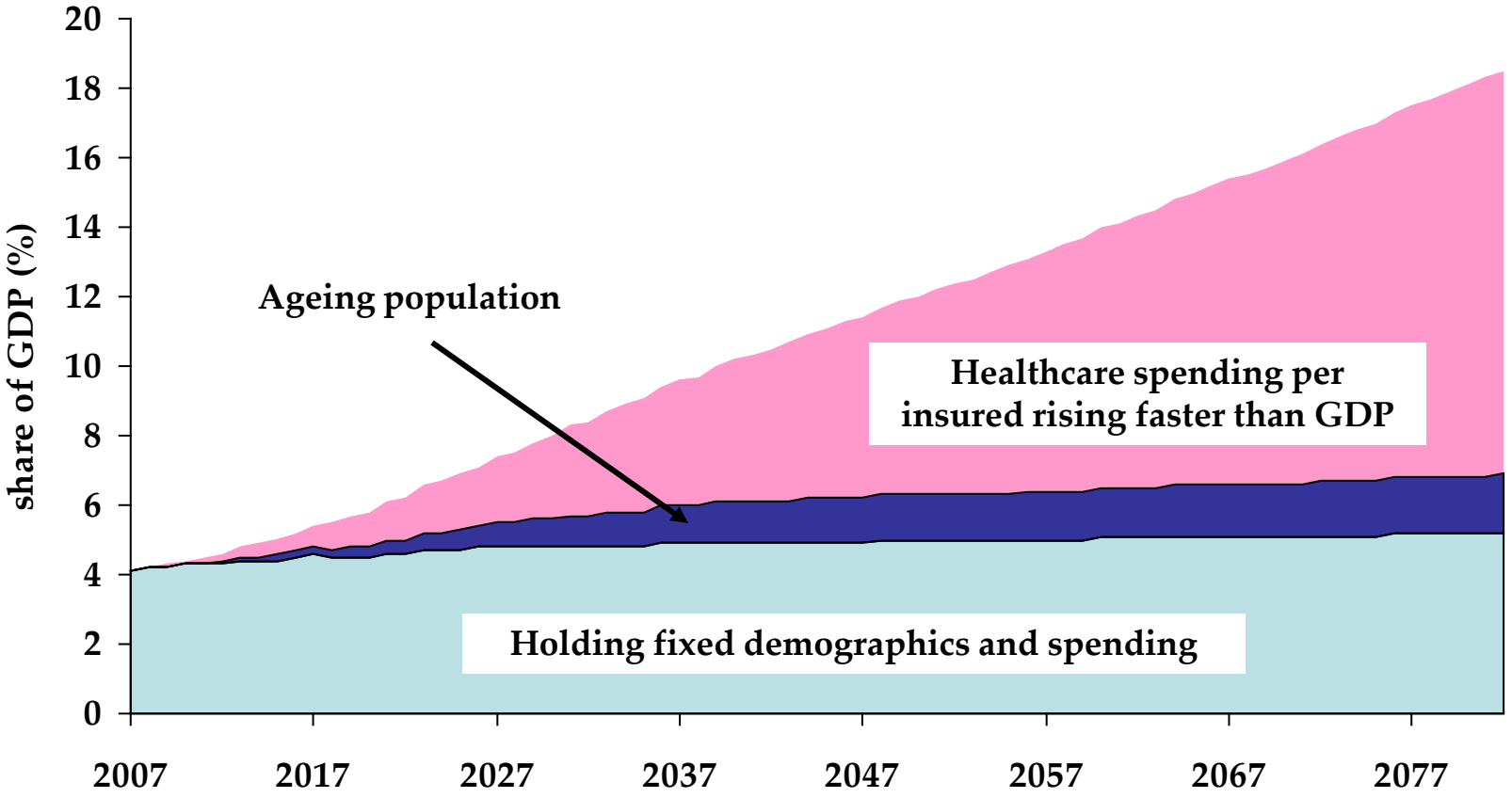
- Medi-spending is growing much faster than GDP
- Why?
  - Increase in covered population (baby boomers, again!)
  - Increase in spending per enrollee
- Which is more important?

Projected expenditure



source: http://www.cbo.gov/ftpdocs/87xx/doc8758/11-13-LT-Health.pdf

Why is spending growing?



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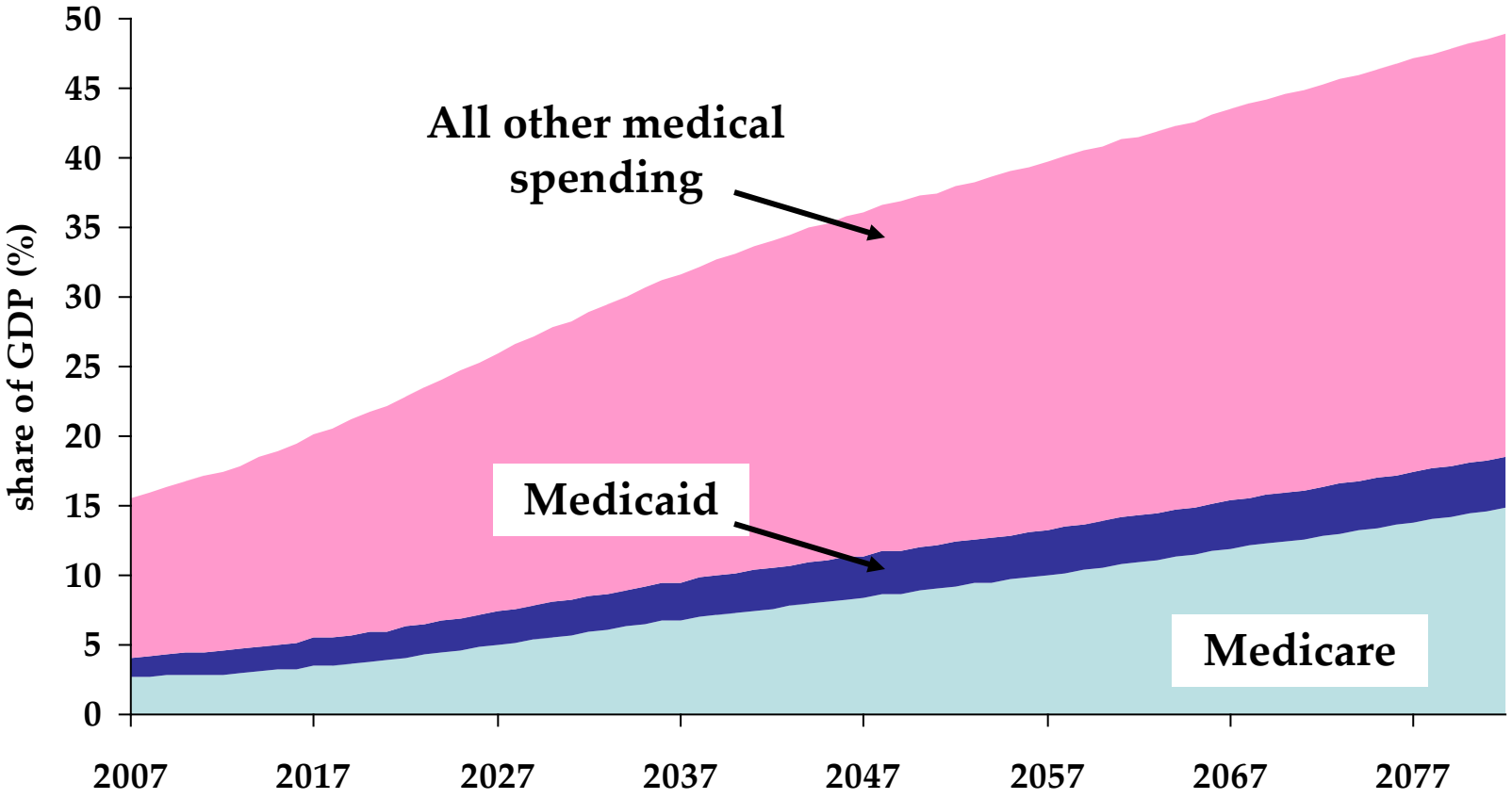
Medicare and Medicaid

- What can be done?
  - Reduce people receiving benefits
    - Small effect
  - Reduce payments to providers
  - Encourage efficiency in health care
    - Economists: benefits vs. costs of treatments
    - Most everyone else: incredibly sensitive subject
    - Pass costs of more expensive treatments onto patients
    - Managing chronic conditions: 85% of medicare expenditures are spent on 25% of beneficiaries

Not only a government issue!



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Long term expenditure summary

- U.S. Social Security System
  - "Pay-as-you-go" meets "Baby Boomers"
  - **PDV of unfunded liabilities about 100% of GDP**
- Medicare and Medicaid
  - Expenditures to reach 15% of GDP by 2050
  - Culprit: health care spending growing faster than GDP
  - **PDV of unfunded liabilities about 240% of GDP**
- Will need to cut benefits and/or increase taxes

Taxes and debt summary

- Deficits must be financed
  - By issuing debt today
  - And by running (primary) surpluses in the future
- Sustainability analysis
  - Debt tends to grow unless you run surpluses
- US deficits
  - The biggest issues are not the current deficit, but projected future deficits implied by social security and Medicare-Medicaid payments

Fiscal Policy: For the ride home

- The US (and many other countries) have a progressive income tax: tax rates are larger for people with larger incomes
- Given our analysis of taxes, how are we distorting the labor supply choices of different groups of people?
- Some issues
  - Are income and ability related?
  - Are labor supply/demand elasticities different for different income levels? Who might be more elastic?
- This is a matter of incentives vs. insurance
  - To provide insurance, we distort the incentives of people to supply labor (and capital) to earn income

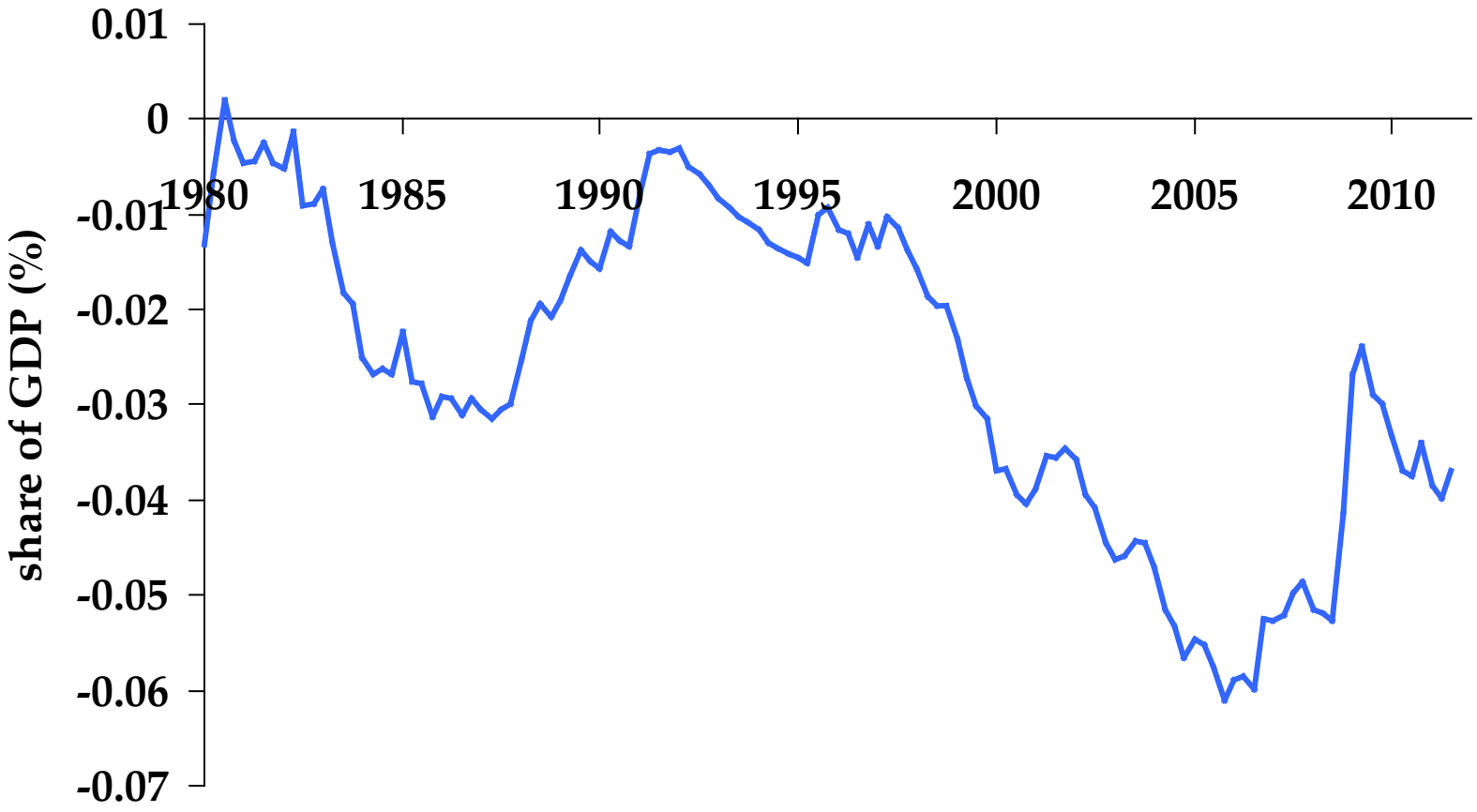
Balance of Payments Roadmap

- Balance of payments accounting
- Foreign debt
  - sustainability
- U.S. current account
- Surplus countries

Warren Buffett

- Annual letter to shareholders, 2006:
  - As time passes, and as claims against us grow, we own less and less of what we produce. ... Should we continue to run current account deficits comparable to those now prevailing, ... our US 'family' will be delivering [a substantial fraction of] its annual output to the rest of the world simply as tribute for the overindulgences of the past.

U.S. net exports



Largest deficits 2008

	Billion USD	% GDP
United States	–788	-4.3
Spain	–155	-10.5
United Kingdom	–105	-4.9
Australia	–53	-6.3
France	–49	-2.4
Italy	–49	-2.4
Greece	–37	-13.9
Turkey	–36	-6.7
India	–32	-3.1
Romania	–25	-14.5

Source: IMF, WEO; current account.

Largest surpluses 2008

	Billion USD	% GDP
China	453	9.8
Japan	195	4.0
Germany	174	5.2
Saudi Arabia	82	31.3
Switzerland	64	15.4
Norway	59	20.0
Netherlands	54	5.9
United Arab Emirates	50	27.5
Russia	49	5.8
Singapore	42	20.6

Capital flows

- Countries
  - When might capital flow from one country to another?

The balance of payments

- Importing more than exporting
  - Trade deficit (or current account deficit)
- How is a current account deficit financed?
  - "Inflow" of capital from abroad
  - Equivalently: sell assets to rest-of-world
  - We say the current account is mirrored by an equal and opposite "capital and financial account"
  - That's why we say **balance** of payments

Balance of payments

- Current account: net exports plus net foreign income
  - NFI usually small, we will mostly ignore it

$$CA = NX + NFI$$

- Financial account: trade in assets

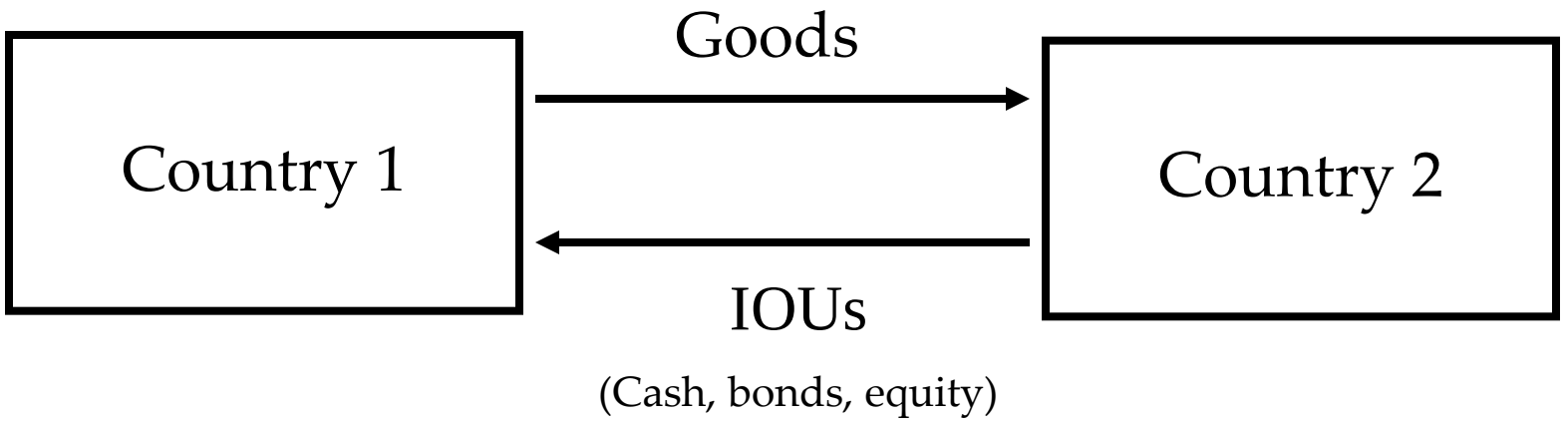
- Balance of payments

$$CA + FA = 0$$

- Note: these are all net concepts

Balance of payments

- BOP = CA + Capital/Financial Account = 0



If Country 1 runs a current account surplus:
There is a capital "outflow" for Country 1, "inflow" for Country 2.

Balance of payments

- What do capital flows finance?

$$S = Y - C - G = I + NX$$

- Accumulating current account deficits and surplus (flows) gives us the stock of foreign assets (assuming no changes in valuation, including exchange rates)

Net foreign assets

- International capital markets
  - Countries own claims on each other
  - Net position (net foreign assets or NFA):

    NFA = Claims on Foreign Countries – Foreign Claims on Us
- Borrowers and lenders
  - If NFA>0, country is net creditor (lender)
  - If NFA<0, country is net debtor (borrower)
- Two terms for the same thing
  - Net foreign assets (NFA)
  - Net international investment position (Net IIP)

US international investment position

Billions of Dollars, end-2010

Category	Assets	Liabilities
Direct investment (cost)	4,429	2,659
Portfolio investment & Other	15,397	20,127
Reserves	489	–
Total	20,315	22,786
Net IIP (=NFA)	–2,471	

GDP (2010) = $14,527 bn IIP/GDP=-17.0%

Source: US Treasury.

Debt

- Net Foreign Assets (NFA) are the total amount owed by the rest of the world to a country
- NFA is a *stock*

  Claims on Foreign Countries – Foreign Claims on us

- Current and financial accounts are *flows;* they measure the *changes* in the stock of assets

$$NFA_{t+1} = NFA_t + \underbrace{NX_t + i * NFA_t}_{\text{Current Account}}$$

  - We are ignoring net asset revaluations

U.S. current account

The likely outcome, absent any major policy changes: current account deficits of 7% of GDP in 2006, and of more than 8% of GDP in 2008.

Roubini and Setser 2004

Where do statements like this come from?

Evolution of debt

- Simplified version of Roubini and Setser
- Balanced growth path

$$Y_{t+1} = (1+g)Y_t$$

- Nominal interest rate i on assets,
- Evolution of net foreign debt-gdp ratio

$$\frac{NFA_{t+1}}{Y_{t+1}} = \frac{(1+i)}{(1+g)}\frac{NFA_t}{Y_t} + \frac{1}{(1+g)}\frac{NX_t}{Y_t}$$

Evolution of debt

- $NFA_{2004}/Y_{2004} = -0.25$
- $i = 0.045, \quad g = 0.03$
- Assuming the trade deficit is still 5.8% of GDP…
- …then the debt-to-GDP ratio evolves as

$$\frac{NFA_{2005}}{Y_{2005}} = \frac{(1.045)}{(1.030)} \times (-0.25) + \frac{1}{1.030} \times (-0.058)$$

- By 2008: NFA/Y = -0.54 and CA/Y = -0.083
- Interest payments would be 2.5% of GDP

Current account deficits

- Current account deficits reflect
  - Low savings
  - High investment
  - Both
- Are current account deficits "bad?"
  - Are we borrowing to finance good investments? Are savings are too low for the long run?
  - Is it "bad" when a firm issues bonds?

Is the U.S. in trouble?

- Pessimistic view
  - Deficits are financing consumption and government deficits
  - Debt is accumulating – and so is interest
  - We'll have to pay it off some day
- Optimistic view
  - Capital inflow shows US is an attractive place to invest
  - Interest burden remains small

What about the surplus countries?

- Countries with low rates of return seek investments abroad
  - Switzerland, Germany, Japan have all had lower growth rates of GDP compared to the U.S.
- Oil producing countries
  - High oil prices bring income, but not necessarily domestic investment opportunity
- High savings countries

Why does China save so much?

- Households
  - Inadequate financial markets (financial repression)
  - Limited social programs (precautionary savings)
  - Demographics
- Corporations
  - Low dividends (SOEs)
  - Receive capital transfers from government

BOP Takeaways

- BOP accounting keeps track of goods, services, and asset trades
- Current account measures changes in the stock of net foreign assets (absent valuation shifts).
- Current account reflects net borrowing/lending
  - To explain current accounts, explain savings and investment

BOP Deficit takeaways

- U.S. current account deficit is large
  - Why are foreigners accumulating U.S. assets?
  - Are Americans saving sufficiently?
- Are current account deficits bad?
  - Depends on what is being done with borrowed funds.
  - Deficits can not go on forever.