

Econ 101: Principles of Microeconomics

Chapter 7: Taxes

Fall 2010

Outline

- 1 The Excise Tax
- 2 The Benefits and Costs of Taxation
- 3 Tax Fairness versus Tax Efficiency
- 4 The Tax System

Taxes

- In chapter 5, we looked at ways that the government intervenes in the marketplace using
 - Price ceilings
 - Price floors and/or price supports
 - Quotas
- However, we are used to a much more frequent form of government intervention: Taxes

“... in this world nothing can be said to be certain, except death and taxes.” Benjamin Franklin (13 November 1789)
- Taxes are essential for government to function.
- However, as we shall see, taxes also distort the incentives of the marketplace, creating losses in efficiency.
- Policymakers must trade-off the gains from government programs against the inefficiencies created in the process of raising the funds necessary for its operation.
- While we will look at a variety of tax forms, we will start with one of the simplest: the **excise tax**.

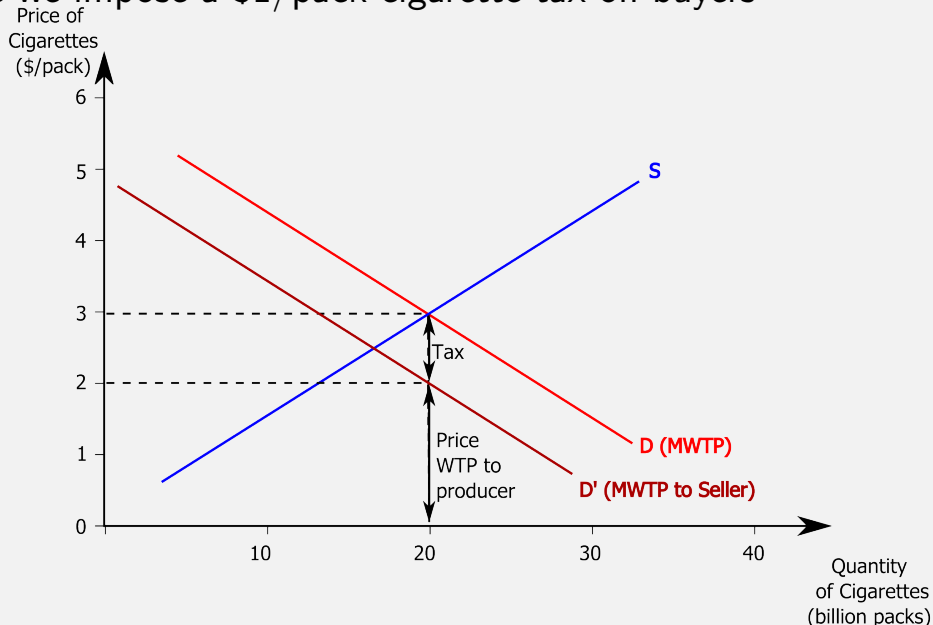
The Excise Tax

The Excise Tax

- An **excise tax** is a tax charged on each unit of a good or service that is sold.
- This not the same as a sales tax in that it is levied per unit of the good, rather than as a percentage of the sales.
- Examples of excise taxes include taxes on
 - gasoline
 - cigarette
 - alcohol
 - hotel rooms
- As these examples suggest, one of the typical reasons for excise taxes is to discourage consumption of the good (i.e., so-called “sin taxes.”)
- However, excise taxes are also levied as a source of revenue.

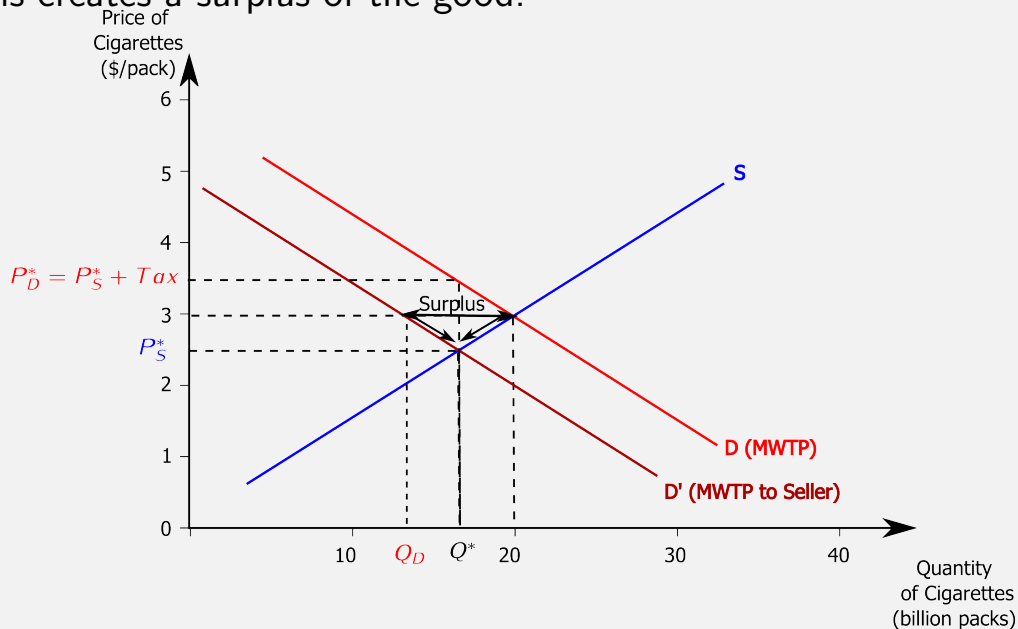
The Impact of Excise Tax Levied on Buyers

- The excise tax can be levied on either the buyer or the seller of the commodity.
- Suppose we impose a \$1/pack cigarette tax on buyers



The Impact of Excise Taxes Levied on Buyers (cont'd)

- The impact of the excise tax is to shift the demand curve faced by producers *down* by the amount of the tax.
- This creates a surplus of the good.

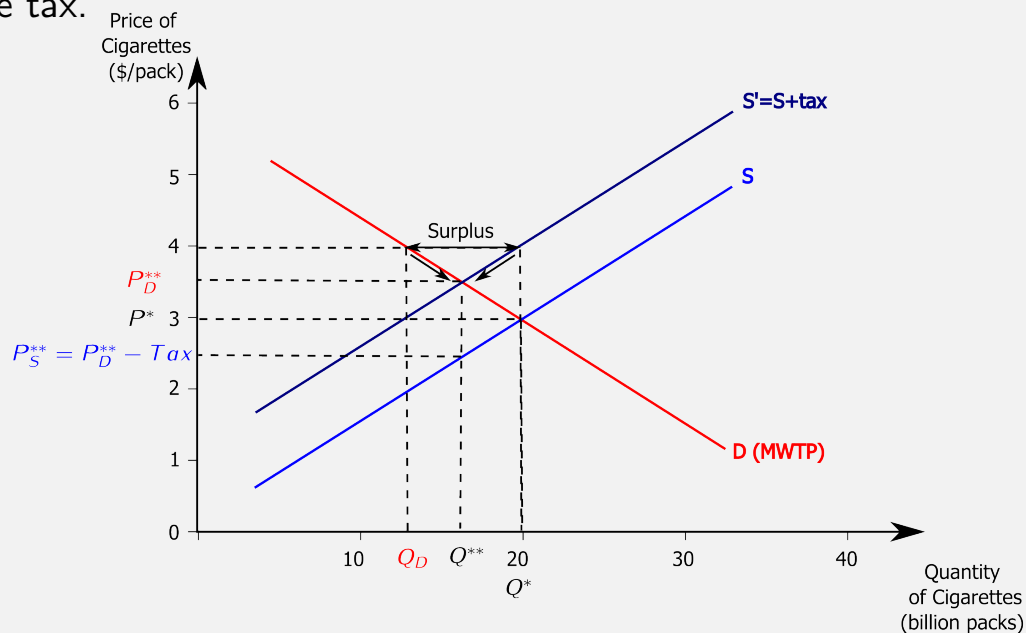


The Impact of Excise Taxes Levied on Buyers (cont'd)

- There are three consequences of the excise tax:
 - ① The overall quantity sold is reduced.
 - ② The price paid by consumers for the product has *increased* from P^* (\$3 in our example) to P_D^{**} (\$3.50 in our example)
 - ③ The price received by producers for the product has *decreased* from P^* (\$3 in our example) to P_S^{**} (\$2.50 in our example)
- Notice that the tax burden is not born solely by the consumer, even though the tax is levied on the consumer.
- Who bears the burden of the tax is referred to as the **tax incidence**.
- In our example, the tax incidence is evenly split between the buyer and the seller.
- This is *not* typically the case, but depends on the elasticities of supply and demand.

The Impact of Excise Tax Levied on Sellers

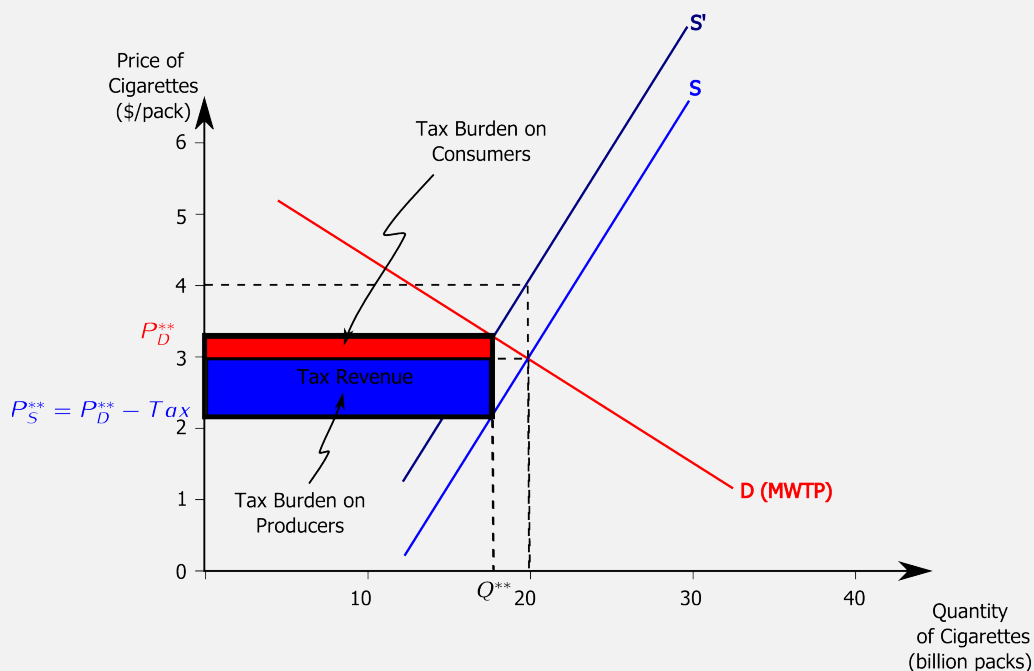
- Suppose, instead, that we impose the \$1/pack cigarette tax on sellers
- The effect of this tax is to shift the supply curve up by the amount of the tax.



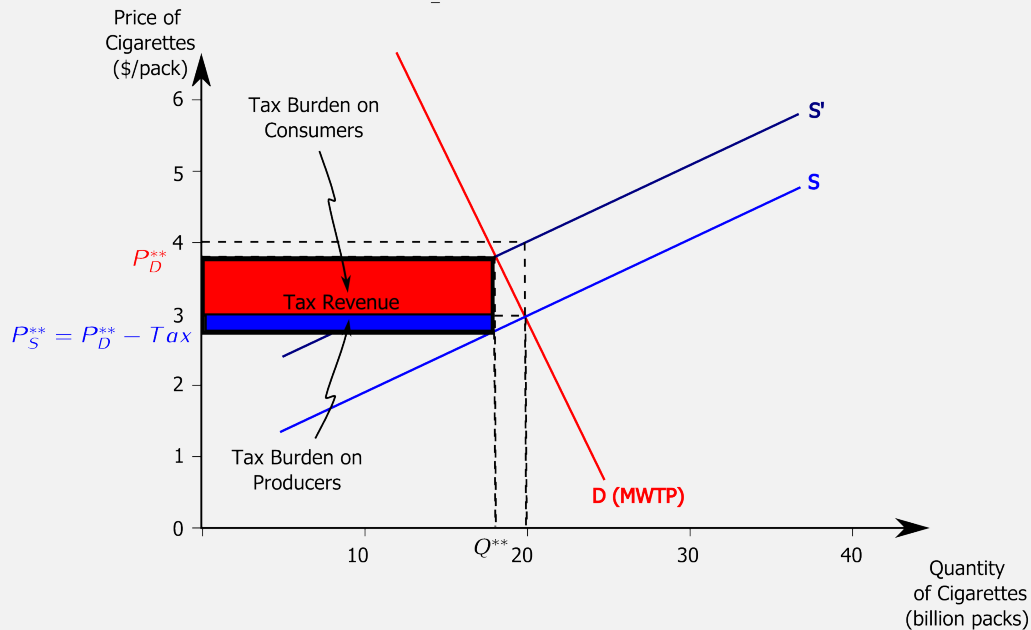
Tax Incidence

- If you look at the outcome here, the result is *identical* to what happened when the tax was levied on the buyer instead.
- This is an important lesson: Who actually pays the tax (i.e., the tax incidence) does not depend on who the tax is levied on.
 - When the tax is levied on consumers, they reduce their WTP to producers.
 - Producers have to reduce the price they charge consumers to get them to buy their product *given* the new tax.
 - Conversely, when the tax is levied on producers, they pass a portion of this additional cost onto consumers in the form of higher prices.
- The tax incidence will depend on the price elasticities of supply and demand.
 - 1 When the price elasticity of demand is higher than the price elasticity of supply, an excise tax falls mainly on producers.
 - 2 When the price elasticity of supply is higher than the price elasticity of demand, an excise tax falls mainly on consumers.

Tax Incidence: Demand More Elastic than Supply



Tax Incidence: Supply More Elastic than Demand



The Benefits and Costs of Taxation

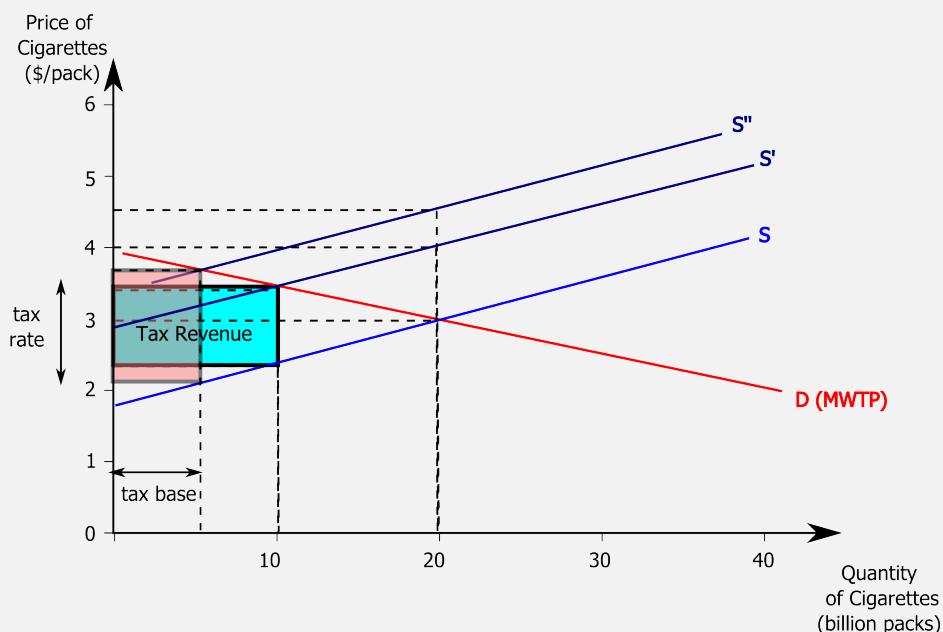
- Tracing out the benefits and costs of taxation requires understanding
 - what revenues are collected as result of the specific tax being used;
 - the benefits from the programs that the government undertakes; and
 - any inefficiencies created in the process of collecting the taxes and in spending the revenues collected.
- Again, we will use an excise tax to illustrate the concepts.

Revenues

- The amount of revenues collected by an excise tax depends upon:
 - ① The **tax rate**: The amount of tax per unit of whatever is being taxed.
 - ② The **tax base**: The quantity of the good being taxed.
- Increasing the tax rate can either increase or decrease the total tax revenue, depending upon
 - ① The elasticity of demand;
 - ② The elasticity of supply; and
 - ③ The size of the tax base.
- This is because increasing the tax rate has two effects:
 - ① It increases the tax revenue per unit of the good taxed
 - ② It reduces the tax base by discouraging consumptions

Changing Revenues from a Tax Increase

Consider the impact of raising our cigarette tax from \$1 to \$1.50.



Cigarette Tax Increases in Practice

Cigarette demand is inelastic (as is the case for most addictive substances.)

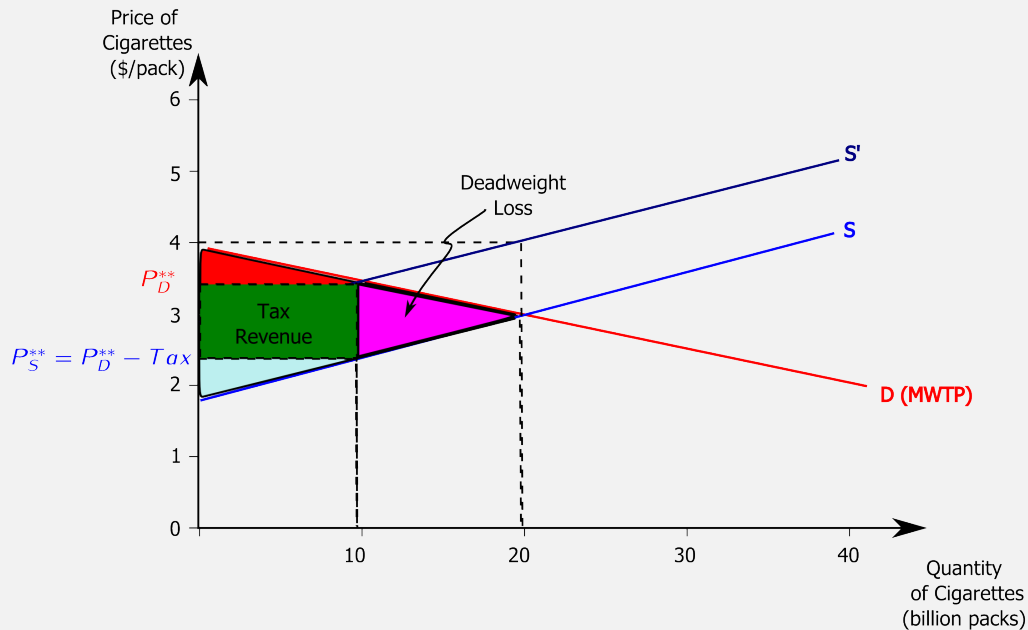
| State | Year | Tax Increase | Change in Tax Revenue |
|------------|------|--------------|-----------------------|
| Utah | 1997 | \$0.25 | +85.5% |
| Maryland | 1999 | \$0.30 | +52.6% |
| California | 1999 | \$0.50 | +90.7% |
| Michigan | 1994 | \$0.50 | +139.9% |
| New York | 2000 | \$0.55 | +57.4% |

These increases in revenue are *despite* likely sales losses to neighboring states and illegal sales.

The Cost of Taxation

- The cost of taxation is *not* the amount of money paid by the taxpayer.
 - The tax revenue collected by the government is presumably spent providing services desired by society as a whole.
 - ...though there are costs here if the government provides those services inefficiently.
- Yet, even if the government uses taxes by providing socially desirable goods and services there is a cost to taxation
 - This is because the tax distorts the market price, driving a wedge between consumer's MWTP and producer's MC.
 - This results in a **deadweight loss**
- The deadweight loss will be larger
 - the more elastic supply is
 - the more elastic demand is.

Surplus Loss with Excise Tax



The Deadweight Loss

- The deadweight loss is a real cost of the excise tax caused by the reduced consumption under the tax.
- Trades that were otherwise beneficial are lost because of the tax.
- The deadweight loss of a tax will be smaller if
 - 1 Demand is less elastic (i.e., the quantity demanded is not substantially affected by the tax).
 - 2 Supply is less elastic (i.e., the quantity supplied is not substantially affected by the tax)
- There can be additional losses due to the tax if the government is inefficient in providing its services.

Two Principles of Tax Fairness

- Different forms of taxes vary substantially in terms of who pays the tax, particularly if you take into account the actual incidence of the tax as opposed to who “writes the check.”
- There are two basic principles that are used to justify the “fairness” of a tax:
 - ① **The benefits principle:** Those who benefit from public spending should bear the burden of the tax that pays for that spending.
 - The federal gasoline tax is an example in that it is used for the maintenance and improvement of federal roads.
 - However, gasoline usage and highway usage are not perfectly aligned.
 - The benefits principle is not frequently used as the justification for taxes.
 - ② **The ability-to-pay principle:** Those with a greater ability to pay a tax should pay more tax.
 - This concept is typically extended to mean that, not only should the wealthier pay more absolutely, but that they should pay a higher percentage of their income.

The Tax System

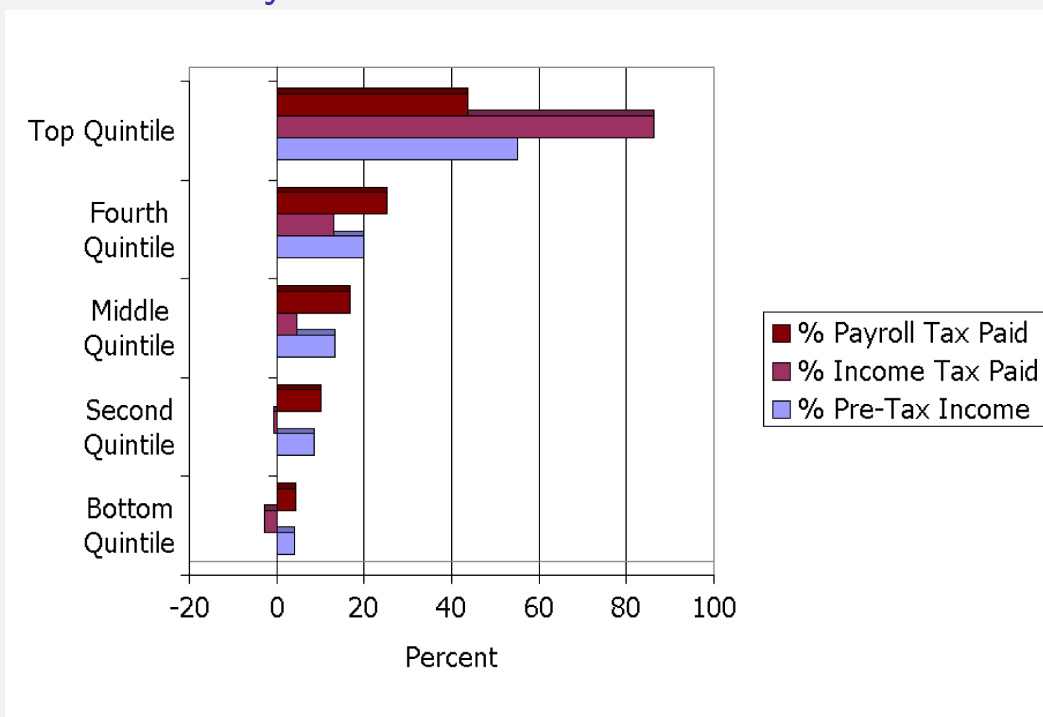
The US Tax System

- The US tax system is made up a variety of programs, including
 - ① **Income tax:** a tax that depends on the income of the individual or family from wages and investments.
 - ② **Payroll tax:** a tax that depends on the earnings an employer pays to an employee.
 - ③ **Sales tax:** a tax that depends on the value of goods sold.
 - ④ **Profit tax:** a tax that depends on the firm’s profits.
 - ⑤ **Property tax** a tax that depends on the value of property (e.g., one’s home)
 - ⑥ **Wealth tax** a tax that depends on an individual’s wealth.
- These taxes differ in terms of the
 - The **tax base:** The measure of value that determines how much tax an individual or firm pays.
 - The **tax structure:** This specifies the relationship between the tax base and how much tax an individual pays.

Progressive versus Regressive Taxation

- Tax structures are often quite complex.
- The simplest tax structure is the **proportional tax** (or *flat tax*) where the percentage of the tax base is a constant.
- Who pays the tax then depends on the tax base (e.g., who consumes the most cigarettes in our excise tax example).
- More broadly, policymakers are typically concerned with how taxes vary with the income and/or wealth of the taxpayer.
 - ① A **progressive tax** takes a larger share of the income of high-income taxpayers than of low-income tax payers.
 - ② A **regressive tax** takes a smaller share of high-income taxpayers than of low-income tax payers.
- Income taxes (both federal and state) tend to be progressive; though one has to be careful to keep in mind various tax loopholes.
- In contrast, both sales and payroll taxes tend to be regressive.
 - sales taxes because the wealthier save a larger % of their income
 - payroll taxes because they are capped and payroll income is a smaller % of total income for the wealthier.

Income versus Payroll Taxes



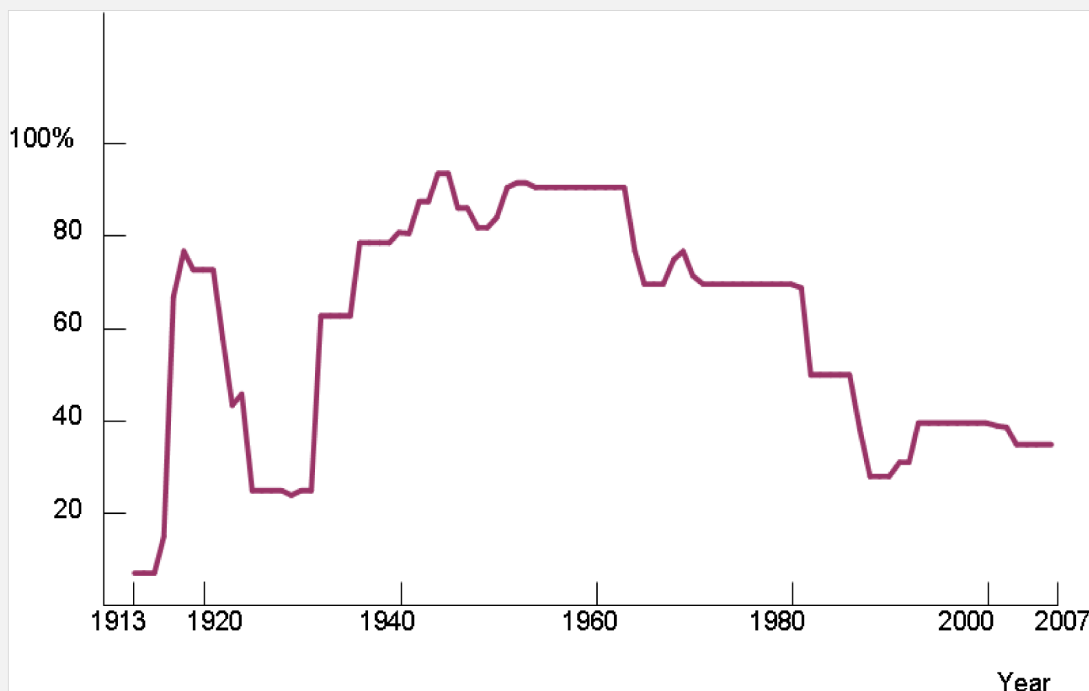
Federal versus State and Local Taxes

- Federal taxes tend to be more progressive over than state and local taxes in part because state and local governments rely on more regressive types of taxes:

| Tax Source | Federal (\$billion) | State and local (\$billion) |
|------------|---------------------|-----------------------------|
| Income | 1537.5 | 275.1 |
| Payroll | 901.6 | |
| Profit | 373.1 | 62.4 |
| Sales | | 415.4 |
| Property | | 367.8 |

- States and local governments are more inclined to avoid highly progressive tax structures because of **tax competition**; i.e., they fear that high taxes on the wealthy will encourage them to live elsewhere.
- For all levels of government there is a trade-off between equity and efficiency in setting high marginal tax rates for the wealthy.
 - ① The wealthy clearly have a greater ability to pay.
 - ② However, high marginal tax rates discourage individuals from trying to earn more.

The Top Marginal Tax Rates in the US



Overall Tax Burden

