Plan

- Revenue System
  - Tax incidence:
    - Statutory
    - Economic
  - Determinants of the economic incidence
    - Partial equilibrium framework
      - Demand and supply elasticity
      - Market structure
      - Stock versus Flow taxation

Revenue System

- Deficit Finance
  - To finance government expenditures
  - To (partially) control Macroeconomic stability
- Taxes
  - To finance government expenditures
  - To correct for externalities
  - To redistribute income

Effect of Taxes

- Taxes alter prices and (real) income
- Therefore, they induce changes in economic behavior
- This leads to changes in allocation of goods in the economy
  - Thus, we need to understand
    - Efficiency implications of imposing a tax
    - Equity implications thereof
### The way ahead

- **Tax incidence (Chapter 12):**
  - Who bears the burden of taxes?
  - How will a tax affect economic behavior and the resulting allocation of goods?
- **Optimal Taxation (Chapters 13, 14):**
  - Criteria for tax design
  - What is the best available tax to achieve the desired objective?

### Tax Incidence

- **Statutory incidence of a tax**
  - Who is legally responsible for the tax?
- **Economic incidence of a tax**
  - The change in the distribution of private real income induced by the tax

*Note: Only people bear taxes. Economic and statutory incidence may differ, so that the tax may be "shifted"."

### Partial Equilibrium Framework

**Perfect Competition**

- What is the relationship between statutory incidence and economic incidence?
  - Unit tax on commodities
    - Paid by producer
    - Paid by consumer
  - Ad valorem tax on commodities
    - Paid by producer
    - Paid by consumer

### Unit tax on Commodities

- Suppose producers (sellers) have to pay $u per gallon of the gasoline sold.
  - Draw the market equilibrium before and after imposition of the tax
  - How will the consumer and producer price change?
  - Who will bear higher economic burden?
- Now suppose the consumers (buyers) have to pay the same tax.
  - How will your analysis differ from the previous case?
The economic incidence of a unit tax is independent of statutory incidence.

The economic incidence of a unit tax depends on the elasticities of supply and demand:
- More tax is shifted on the producers if
  - The supply is more inelastic or if
  - The demand is more elastic

Ad Valorem Tax
- Ad valorem tax is a proportional tax.
- Consider a market for good X.
  \[ P_D = 10 - X, \quad P_S = 2 + X \]
- Find the equilibrium.
- Assume that a 20% tax is imposed on the consumer.
- Find the after-tax equilibrium:
  - Quantity sold and bought
  - Consumer and producer prices
  - Calculate the tax incidence
    - The change in consumer price
    - The change in producer price

Ad Valorem tax, continued
- Why was the tax burden distributed equally in the previous example?
  - Elasticity of both supply and demand were equal (compute them).
- What if they are not equal?
**Ad Valorem Tax, another example**

- Consider a different market for X
- Calculate the incidence of a 20% tax (on producer).
- Who bears higher burden: the consumer of the producer?
- Why?

\[
P_D = 10 - X \;
P_S = 2 + 3X
\]

**Tax incidence under imperfect competition: Monopoly case**

- Assume a monopolist faces a downward sloping demand curve.
- And a unit tax is imposed on the consumers.
- How will the outcome (quantity produced, consumer and producer price change)?
- Who will bear the burden?

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**Tax on Profits**

- We saw that commodity taxation (economic) incidence does not depend on the statutory incidence.
  - Rather, it depends on the elasticity of supply and demand.
- If the tax is imposed on the firm’s profits, the firm (producer) bears all the burden.
- WHY?

**Tax Incidence and Capitalization**

- Assume you bought a house and the property taxes were suddenly increased.
- Will the price of your house change and if so, how?
- Taxes are paid over time.
- Under *capitalization*, the price of an asset incorporates the stream of tax payments.
**Tax Capitalization**

- The price of the asset should fall by the present value of the tax payments:
  \[
  \frac{u}{1 + r} + \frac{u}{(1 + r)^2} + \ldots
  \]

- Thus, the owner of the asset bears all the burden.

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**Capitalization of taxes and local amenities: Local Economy**

- Resident (homogeneous) workers and resident (homogeneous) firms
- Workers derive utility from a composite good, land and public goods and local amenities;
- Firms use workers, land, capital and (public) infrastructure to produce a composite good;
- Land and labor markets clear in each locality;
- Both workers and firms are mobile, they can choose any region to locate in
- Public goods and taxes are exogenous

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**Local Equilibrium**

\[
V(W_r, P_r, G, x) = V_0
\]

\[
\pi(W_r, P_r, G, x) = \pi_0
\]

**An Improvement in Infrastructure**

\[
V(W'_r, P'_r, G, x) = V_0
\]

\[
\pi(W'_r, P'_r, G, x') = \pi_0
\]
Conclusions

- Both taxes and local amenities can capitalize in house prices.
- Taxes and local amenities can also be reflected in local wages.
- Can you explain a positive relationship between wages and crime rates across counties?