REVENUE SYSTEM

TAX DESIGN

Plan

- Criteria for tax design
  - Efficiency (cost of public funds)
  - Equity
  - Administrative costs
  - Simplicity (tax avoidance)

Tax avoidance and tax evasion

- Tax avoidance
  - change in behavior to avoid tax liability
- Tax evasion
  - failing to pay legally due taxes

Common tax frauds

- Double accounting
- Cash transactions
  - working for cash
  - making deals in cash
- Barter transactions
  - for legally taxable transactions
Why a simple tax code is better?

- It reduces the costs of audit
- (Possibly) increases the amount of voluntary paid taxes

Tax evasion

- Assume Mr. A is risk neutral, he cares only about his expected income
- His tax rate is \( t \)
- He can be audited with probability \( p \)
- If underreported income is found, his marginal penalty is \( M \).

Equity considerations

- Progressive income tax
- Tax on luxury goods

Measures of tax progressiveness

- Marginal tax rate
- Average tax rate
Efficient taxation?

- Tax on consumption of a specific commodity introduces distortion of prices (consumers’ price is different from the producers’ price)
- Therefore, as the prices contain information about relative scarcity of resources, the distortion will make the producer and consumer to get different “message” about the scarcity
- Thus, we should expect inefficiency to arise.

Tax on consumption versus head tax

- Consider a consumer who devotes all her income to two goods x,y
- Assume that the consumption of good x is taxed.
- Assume now that instead of the consumption tax, a head tax (lump sum tax) is imposed such that the consumer’s utility is unchanged.
- Which tax will bring higher revenues?

Head tax

- If the head tax does not introduce distortions, why is not it widely used?
- Is income tax equivalent to a head tax?

Case Study1: Bread Subsidy and Happy Cows

- A benevolent king decides to help the poor in his country. Most of the population are peasants.
- He authorizes a huge subsidy for bread. As a result the consumer's price for bread drops substantially; bread is now cheaper than any of the raw materials used for its production.
- Suddenly he realizes that the outlays to cover the subsidy grew by much more than he expected (his economists calculated the increase in bread demand by the poor).
- What inefficiency could this subsidy bring?
Case study 2: How to finance building a bridge?

- A small community (a town) decides to build a bridge (made from concrete). All of the population is in the construction business.
- To raise money for the bridge two suggestions were made:
  - 1. Tax the sales of concrete, get the proceeds and then buy concrete in the market;
  - 2. Get 10% of the produced concrete (in the town) and use for the bridge.
- What are advantages and disadvantages of each one of the methods? What is an alternative?

What did we learn?

- Inefficiency that taxation brings is due to the altered “trade-offs” that leads to
  - substitution
  - “tax evasion”
- which distorts the “natural” (pre-tax) allocation.

Efficient (Optimal) Taxation

- Assume Stella spends all her income on two commodities, \( x, y \)
- All her income is derived from earnings, wage rate is fixed at \( w \)
- Her budget constraint is \( w(T-t) = P_x x + P_y y \)
- Then a “head tax” will be equivalent to the tax on leisure, consumption of \( x,y \) at the same rate.
- Problem: leisure can not be taxed.

Compensated Demand

- Compensated demand is the relationship between the quantity demanded and the price where the quantity demanded changes only due to the substitution effect (income effect is neutralized)
- Compensated demand can be used to illustrate the deadweight loss from the taxation.
Ramsey Rule (Frank Ramsey 1927)

- Consider an economy populated by identical consumers
- Assume that the goods in the economy can be produced using labor input only
- The government has to raise the revenue through commodity taxes, which will be used to purchase the labor input (say, for defense)
- The government’s objective is to maximize the well-being of the citizens (to introduce as little distortions as possible)

What should govern the choice of optimal commodity taxes?

- Marginal excess burden if tax revenue is the burden on consumer and producer when government collects a dollar of revenue by raising taxes
- MEB is also known as the cost of public funds.
- Efficiency criterion: excess burden should be minimized. Therefore marginal excess burden (per dollar of revenues) from all the taxed commodities should be equalized.

Ramsey rule, continued

- Consider compensated demand for good \( X \)
- Assume that the initially quantity \( X_0 \) was sold at a price \( P_0 \)
- After the unit tax \( u \) is imposed, the consumers’ demand is decreased by \( \Delta X \) to \( X_1 \)
- What is the marginal excess burden in this market?
  - It is an increase in the deadweight loss divided by an increase in tax revenues brought about by a slight increase in the tax on good \( X \)

Equating the MEB per dollar spent

- It can be shown that
  - the marginal excess burden can be approximated by the change in the quantity demanded as a result of imposition of the tax, \( \Delta X \)
  - the marginal increase in revenues can be approximated by the difference between the after tax quantity demanded in the market and the change in the quantity due to the tax, \( X_1 - \Delta X \)
- Efficiency requires that the MEB$/ should be equal in the two markets:
  \[
  \frac{\Delta X}{X_1 - \Delta X} = \frac{\Delta Y}{Y_1 - \Delta Y}
  \]
To minimize the total excess burden the tax should be set in such a way that a percentage reduction in the demand for each commodity should be the same.

Excess burden is a consequence of the distortion in quantities.

Assume goods $x,y$ are neither complements nor substitutes.

Construct compensated demand for each one of the goods.

How high should be the taxes on $x,y$ to minimize the distortion?

If the demand for goods $X,Y$ is independent of the cross price effects, then

- ad valorem tax on $x,t_x$ is the percentage of the price increase in $x$ and the price elasticity of $x$ is the percentage increase in quantity due to percentage increase in price.
- the same is true for good $y$

Then, the optimal taxes should satisfy $t \eta_x = t \eta_y$.

In other words, taxes should be inversely related to elasticities.