Lecture # 16 -- Efficiency and Equity/Monopolies

I. Social Welfare Functions

- Social welfare function – A function reflecting society's views on how the utilities of its members affect the well-being of society as a whole.
    - Social welfare functions provide a framework of thinking about the tradeoffs presented when considering redistribution.
    - In contrast to Pareto efficiency, the goal is to maximize the "greatest good," where the decision maker's values (e.g. her SWF) define what is "good"
- We will consider three different examples in class
- The utilitarian social welfare function aggregates each individual's utility
    - Each person's utility is given equal weight
    - Because of diminishing marginal utility, provides some support for redistribution
    - The marginal utility from an extra dollar of income will be greater for a poor person than a rich person
- A multiplicative social welfare function considers the product of each individual's utility.
    - Multiplication puts greater weight on more equal distributions
        - Punishes more unequal distributions; 2*2=4, average is 2. 1*3=3, average is 2. 0*4=0, average is 2.
        - But picks up on increases; 2*2=4, 2*3=6.
- For the Rawlsian social welfare function (a/k/a the Maximin Criterion) the welfare of society depends only on the utility of the person with the lowest utility.
    - The philosophy behind Rawls' criterion follows from the notion of original position
        - Imagine that, before you are born, you have no idea what your position in society will be. What distribution of income would you like society to have?
        - Rawls refers to this as the "veil of ignorance"
    - Rawls assumes people are risk adverse, and thus would thus choose an outcome that raises the welfare of the least advantaged
    - With the Rawlsian SWF, not all Pareto improvements increase SWF (e.g., if increase rich person's utility). However, they do not hurt it, either.
    - Critiques:
        - Does this provide incentives to create wealth?
        - Are people actually that risk averse?
            - People might be willing to take chances.

	Utility person 1	Utility person 2	Utility person 3	AVERAGE	Utilitarian SWF	Rawlsian SWF	Multiplicative SWF / 1000
A	80	80	40	66.7	200	40	**256**
B	70	70	50	63.3	190	**50**	245
C	100	80	30	70.0	**210**	30	240

- The above table illustrates three policy options (A, B, and C), and the utility that three different people get from each policy.
    - The last three columns show how different social welfare functions would rank each option.
- What is the relevance of social welfare functions?
    - Specifying a social welfare function for society would be difficult
    - Unless there is unanimous agreement, there is no voting scheme that guarantees a stable result.
    - Thus, a social welfare function should not be seen as a starting point for analysis, but rather an outcome of value judgments made as part of the policy process.
        - That is, it allows us to evaluate the philosophy behind policy goals.

II. Efficiency and Equity

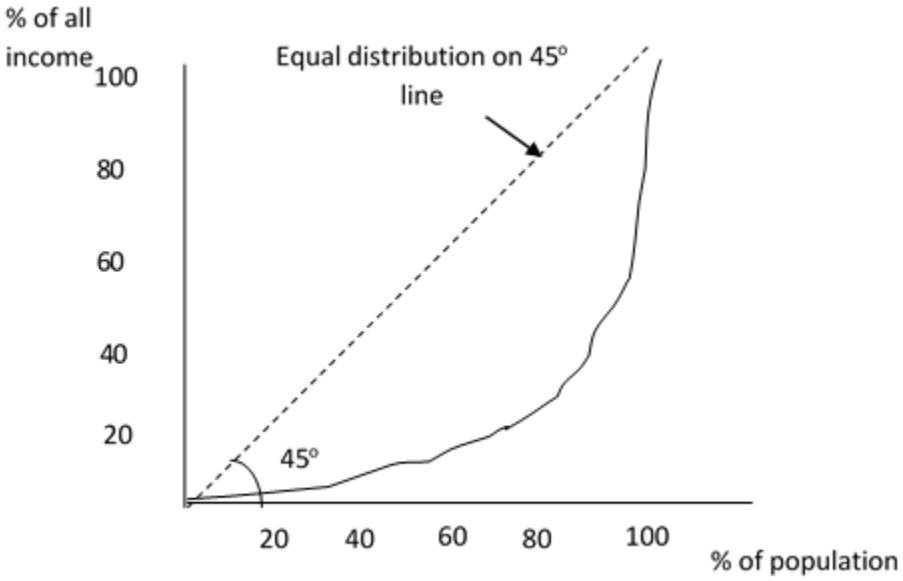
- Thus far, we have focused only on efficiency. Might the government have a role to play even if the market can allocate resources efficiently?
    - Markets allocate resources based on *ability to pay*. In some cases, this may lead to outcomes that society finds unacceptable.
    - The key point is that efficiency alone is not enough to rank alternative allocations of resources.
    - Explicit value judgments are necessary.
- Note that the First Theorem of Welfare Economics only guarantees that an efficient outcome will occur in a perfectly competitive market. *It does not say whether or not the outcome will be equitable.*
- Thus, we face a tradeoff between efficiency and equity.
    - Governments may choose to intervene in an economy to improve equity, even if the intervention is not efficient.
    - Essentially, efficiency is about how big the economic "pie" is, and equity is about how slices of the pie are divided up.

- The article on license plates in China shows the implications of different methods of allocation.
    - In this case, Chinese cities limit the number of license plates available.
    - Since there is a scare supply, the allocation of plates must be decided somehow.
    - Beijing uses a lottery
        - Thus, allocation depends on luck
        - The value a potential owner places on a license is not reflected in the decision.
            - This makes a black market possible.
    - Shanghai auctions license plates
        - The auction uses market forces. Those willing to pay the most (e.g. valuing a licenses plate the most) win the auction.
        - But, this limits license plates to those with high incomes
- The articles on price gouging after natural disasters shows the implications of these choices.
    - The need for reconstruction after a disaster drives up the price of building materials (and of labor to do the work). It also increase prices for other services needed, such as hotel rooms
    - This higher price serves as a signal of the increased value placed on these goods and services.
        - It helps to allocate resources to areas of greater need.
        - While this is efficient, it also means that those who are rebuilding need to pay more. As we'll discuss in class, this is a concern to many people. Thus, we can consider alternatives to raising prices.

III. Measuring Inequality

- While we cannot measure social welfare directly, various indicators of both overall well-being and inequality are available.
    - Each has various strengths and weaknesses
- The traditional measure of macroeconomic performance is Gross Domestic Product (GDP).
    - GDP is the sum of the money values of all final goods and services produced in the domestic economy during a year.
        - Does not include sales of intermediate goods and services.
        - Only includes work done within a country's borders
        - Only includes market activities,
            - Note, for example, that this excludes the value of protecting the environment
            - In contrast, the health services used to help someone recover after an accident increase GDP, suggesting the accident makes us better off.
            - Similarly, unpaid work not counted in GDP
- Other indicators try to aggregate multiple measures of well-being
    - The U.N. Human Development Index (HDI)
        - Combines into an index: (1) GDP per capita, (2) Life expectancy at birth, (3) School enrollment
        - Top countries in 2019
            - Norway
            - Ireland
            - Switzerland
            - Hong Kong
            - Iceland
        - The United States is number 17

- Measures of inequality
  - Lorenz curve – A curve that plots the percentage of national income earned by various income groups.
    - Constructed by ranking population from lowest to highest based on income
    - Tells us what percentage of income goes to the poorest X percent of the population
      - Perfect equality is along a 45° line
      - A larger area between the 45° line and the curve represents greater inequality



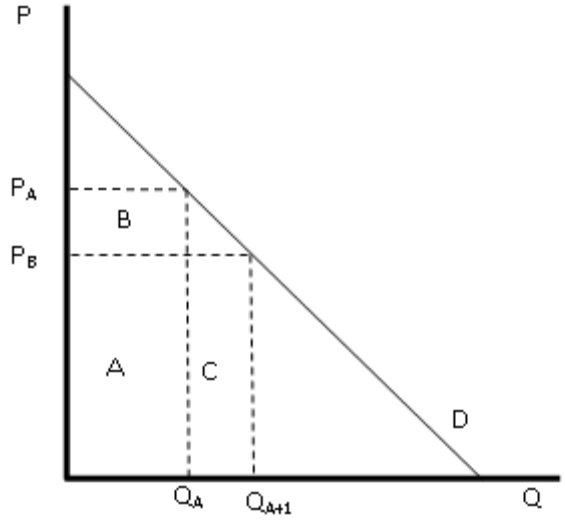
- We can measure the amount of inequality shown by the Lorenz curve using the Gini coefficient.
    - The Gini coefficient equals twice the area of the distance between the curves in the Lorenz diagram.
    - If the area equals 0, Gini coefficient = 0 => no inequality
    - If the area equals 0.5, Gini coefficient = 1 => total inequality (all income held by one person)
    - Sample data
        - Most equal countries (year of survey):
            - Slovenia (2018): 24.6%
            - Czech Republic (2018) 25.0%
            - Slovak Republic (2018) 25.0%
            - Belarus(2019) 25.3%
            - Moldova (2018) 25.7%
        - Least equal countries (year of survey):
            - South Africa (2014): 63.0%
            - Namibia (2015) 59.1%
            - Suriname (1999) 57.6%
            - Zambia (2015) 57.1%
        - Other countries of interest:
            - United States (2018): 41.4%
            - China (2016): 38.5%
            - India (2011): 35.7%
            - France (2018) 32.4%
            - Canada (2017) 33.3%
            - Norway (2018) 27.6%
        - To see the effect of redistribution, we can compare Gini coefficients before and after redistribution
            - United States Gini coefficients before and after transfers

Year	Before transfers	After transfers
2017	0.5056	0.390
2012	0.506	0.389
2000	0.476	0.357
1989	0.450	0.348
1974	0.406	0.316

- Of course, it is also important to consider the causes of inequality
    - If there are underlying causes, such as a lack of access to education or low assets making investment difficult, addressing the underlying causes may be more valuable than simply redistributing income.

IV. Marginal Revenue for a Monopolist

- We now begin to look at what happens if our assumptions about perfect competition are not satisfied. Our first example is monopoly.
- Monopoly -- An industry that has only one seller of the product, for which there are no close substitutes.
- Because the monopolist is the market, a monopolist has control over price.
  - Compare to a firm in perfect competition, in which each individual firm is a *price taker*.
- To increase quantity sold, a monopolist must lower its price *on each unit sold*. This has two effects:
  - The monopolist makes money on the additional quantity sold.
  - The monopolist loses money on the goods that it was already selling, as these are now sold at a lower price.



- Initially, at a price of P_A, the monopolist sells Q_A of the good.
  - Revenue equals areas A + B
- To sell one more unit of the good, the monopolist must lower the price to P_B.
  - Revenue equals areas A + C
    - The monopolist gains area C, but loses B
    - B represents the money no longer earned because the price is lower than before.
- Thus, marginal revenue = C - B
  - Note that area C equals P_B, since the difference between Q_A and Q_{A+1} equals 1.
    - *Thus, MR at the new quantity must be less than P_B.*
  - Area B is the change in price X initial quantity
- Thus, for a monopolist, *marginal revenue is less than price*.

- Bisection rule:
  - For a linear demand curve, the marginal revenue curve bisects the demand curve.
  - E.g.: If P = a - bQ, MR = a - 2bQ.
    - In the example below, demand is P = 6 - Q.
    - Thus, MR = 6 -2Q.
      - Note that the marginal revenue curve goes through the *x*-axis at a quantity of 3, compared to a quantity of 6 for the demand curve. Thus, it cuts this distance in half. That is why this is called the bisection rule.