Pareto Efficiency, Social Welfare and Size of Government

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Outline

Social Welfare and Notions
   Market Equilibrium
   Efficiency
   Equity

Public Sector Growth
   Theories of Public Sector Growth
Market Equilibrium

The demand curve for apartments. The vertical axis measures the market price and the horizontal axis measures how many apartments will be rented at each price.

Equilibrium in the apartment market. The equilibrium price, $p^*$, is determined by the intersection of the supply and demand curves.
Ways to Allocate Apartments

- Market Equilibrium
- The Discriminating Monopolist
- The Ordinary Monopolist
- Rent Control
Utility and Choice

The budget set. The budget set consists of all bundles that are affordable at the given prices and income.

Monotonic preferences. More of both goods is a better bundle for this consumer; less of both goods represents a worse bundle.
Utility and Choice 2

The marginal rate of substitution (MRS). The marginal rate of substitution measures the slope of the indifference curve.

Optimal choice. The optimal consumption position is where the indifference curve is tangent to the budget line.

\[ \text{MRS} = \frac{p_1}{p_2} \]
Social Welfare and Notions

Efficiency: Price mechanism as a means of allocating resources.

- First Fundamental Theorem of Welfare Economics: The competitive equilibrium, where supply equals demand, maximizes social efficiency. [First Theorem]

- Second Fundamental Theorem of Welfare Economics: Society can attain any efficient outcome by suitably redistributing resources among individuals and then allowing them to freely trade. [Second Theorem]
The Edgeworth Box 1

- Graphical tool known as the Edgeworth box\(^1\) can be used to analyze the exchange of two goods between two people.

Let us call the two people involved A and B and the two goods involved 1 and 2. We will denote A’s consumption bundle by \(X_A = (x_A^1, x_A^2)\), where \(x_A^1\) represents A’s consumption of good 1 and \(x_A^2\) represents A’s consumption of good 2. Then B’s consumption bundle is denoted by \(X_B = (x_B^1, x_B^2)\). A pair of consumption bundles, \(X_A\) and \(X_B\), is called an allocation. An allocation is a feasible allocation if the total amount of each good consumed is equal to the total amount available:

\[
x_A^1 + x_B^1 = \omega_A^1 + \omega_B^1 \\
x_A^2 + x_B^2 = \omega_A^2 + \omega_B^2.
\]

A particular feasible allocation that is of interest is the initial endowment allocation, \((\omega_A^1, \omega_A^2)\) and \((\omega_B^1, \omega_B^2)\). This is the allocation that the consumers start with. It consists of the amount of each good that consumers bring to the market. They will exchange some of these goods with each other in the course of trade to end up at a final allocation.

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1. The Edgeworth box is named in honor of Francis Ysidro Edgeworth (1845–1926), an English economist who was one of the first to use this analytical tool.
An Edgeworth box. The width of the box measures the total amount of good 1 in the economy and the height measures the total amount of good 2. Person A’s consumption choices are measured from the lower left-hand corner while person B’s choices are measured from the upper right.
The Edgeworth Box 3

The exchange of two goods between two people.

A Pareto efficient allocation. At a Pareto efficient allocation such as $M$, each person is on his highest possible indifference curve, given the indifference curve of the other person. The line connecting such points is known as the contract curve.
Pareto Efficiency

A Pareto efficient allocation can be described as an allocation where:

1. There is no way to make all the people involved better off
2. There is no way to make some individual better off without making someone else worse off
3. All of the gains from trade have been exhausted
4. There are no mutually advantageous trades to be made

The set of all Pareto efficient points in the Edgeworth box is known as the Pareto set, or the contract curve. The latter name comes from the idea that all "final contracts" for trade must lie on the Pareto set otherwise they wouldn’t be final because there would be some improvement that could be made!
The Edgeworth Box 4 - Market equilibrium

Equilibrium in the Edgeworth box. In equilibrium, each person is choosing the most-preferred bundle in his budget set, and the choices exhaust the available supply.

The Algebra of Equilibrium

If we let $x_A^1(p_1, p_2)$ be agent A’s demand function for good 1 and $x_B^1(p_1, p_2)$ be agent B’s demand function for good 1, and define the analogous expressions for good 2, we can describe this equilibrium as a set of prices $(p_1^*, p_2^*)$ such that

$$x_A^1(p_1^*, p_2^*) + x_B^1(p_1^*, p_2^*) = \omega_A^1 + \omega_B^1$$

$$x_A^2(p_1^*, p_2^*) + x_B^2(p_1^*, p_2^*) = \omega_A^2 + \omega_B^2.$$ 

These equations say that in equilibrium the total demand for each good should be equal to the total supply.
Equity: Contradictory objectives, preferences and values?

▶ The traditional means for representing the values of the community in economics is to use a social welfare function (SWF). SWF requires a social planner maximizes in order to determine the socially optimal policy.

▶ Utilitarian social welfare function: The seminal paper on SWFs is by Bergson (1938), with the most significant further explication by Samuelson (1947, ch. 8). The SWF can be written as follows:

\[ SWF = U_1 + U_2 + U_3 + \ldots + U_n \]

where \( W \) is a real valued function of all variables, and the \( U_i \) s and \( SWF \) are chosen to represent the ethical values of the society or of the individuals in it (Samuelson, 1947, p. 221).
The traditional means for representing the values of the community in economics is to use a social welfare function (SWF).

**Rawlsian Social Welfare Function**: Another popular form of social welfare function is the Rawlsian SWF, named for the philosopher John Rawls. He suggested that society’s goal should be to maximize the well-being of its worst-off member. The Rawlsian SWF has the form:

$$SWF = \min(U_1, U_2, U_3, ... U_n)$$

Since social welfare is determined by the minimum utility in society, social welfare is maximized by maximizing the well-being of the worst-off person in society. (The maximin criterion.)
John Rawls (Theory of Justice) : The Difference Principle permits diverging from strict equality so long as the inequalities in question would make the least advantaged in society materially better off than they would be under strict equality.

- **First**: Each person is to have an equal right to the most extensive scheme of equal basic liberties compatible with a similar scheme of liberties for others.
- **Second**: Social and economic inequalities are to be arranged so that they are both
  - to the greatest expected benefit of the least advantaged
  - attached to offices and positions open to all under conditions of fair equality of opportunity.

In Rawls’s theory, life is a game of chance in which Nature deals out attributes and social positions in a random or accidental way. Now this natural distribution of attributes and chance determination of social position is neither just nor unjust. But it is unjust for society simply to accept these random outcomes, or to adopt institutions that perpetuate and exaggerate them. Thus, a set of just institutions is one that mitigates the effects of chance on the positions of individuals in the social structure.
(The maximin criterion: Déclaration des droits de l’homme et du citoyen, 1789, article 1) Les hommes naissent et demeurent libres et égaux en droits. Les distinctions sociales ne peuvent être fondées que sur l’utilité commune - Men are born and remain free and equal in rights. Social distinctions can only be based upon common utility.

Amartya Sen develops a more concrete approach to rights and "capabilities" : A. Sen defines capabilities as "the freedom that a person has in terms of the choice of functionings, given his personal features (conversion of characteristics into functionings) and his command over commodities."

The functioning of a person is an achievement; it is what the person succeeds in doing with the commodities and characteristics at his or her command. For example, bicycling has to be distinguished from possessing a bike. It has to be distinguished also from the happiness generated by [bicycling].
The historical development of the public sector over the past century can be summarized as one of significant growth.

For the typical industrially developed economy, government expenditure was only a small proportion of gross domestic product at the start of the twentieth century.

Expenditure then rose steadily over the next sixty years, leveling out toward the end of the century.
Theories of Public Sector Growth

- **Development Models**: The basis of the development models of public sector growth is that the economy experiences changes in its structure and needs as it develops.
  - infrastructural expenditure in the development of cities
  - Increasing proportion of public expenditure is diverted away from spending on infrastructure to urbanization and its externalities
  - Transfer payments, such as social security, health, and education, becoming the main items of expenditure
Size of Government

- **Wagner’s Law**: Adolph Wagner was a nineteenth-century economist who analyzed data on public sector expenditure for several European countries, Japan, and the United States.
  - Economic growth requires continual introduction of new laws and the development of the legal structure. Law and order imply continuing increases in public sector expenditure.
  - The process of urbanization and the increased externalities associated with.
  - The goods supplied by the public sector have a high income elasticity of demand.
  - Demand increases more than proportionally with respect to income.
Size of Government

- **Baumol’s Law**: The basic hypothesis is that the technology of the public sector is labor-intensive relative to that of the private sector.
  - The public sector cannot substitute capital for labor, the wage increases in the private sector feed through into cost increases in the public sector.
  - Technological advances in the private sector lead to increases in productivity.
Size of Government

- The government as re-distributor of income and wealth
    - Kuznets' (1955) famous inverted-U curve.
    - Redistribution is limited through deadweight loss in taxation.
    - Politics is majoritarian, equal (one person, one vote) and with full participation (all economic agents vote).
  - Cusack (1997) : Left of-center governments are assumed to favor more redistribution and larger budgets than right-of-center governments.
  - Kristov, Lindert, and McClelland (1992) : Redistribution as a function of the social affinity between different groups in the income distribution.
  - Peltzman (1980) : Increasing equality of income among potential coalition members drive the growth of government
Size of Government

- Interest groups and the growth of government
  - Tullock (1959): discussion of majority rule. more is spent than would be spent under the unanimity rule. Second, if the unanimity rule were in use, there would be no incentive to have the government.
  - Rice (1986) presented evidence suggesting that labor unions and other interest groups were able to induce governments to introduce programs to offset economic hardships
  - North and Wallis (1982): Growth of government and the growth of white-collar and managerial employment in the private sector. Response to the greater transaction costs from organizing a market economy with increasing specialization.
Size of Government

- Bureaucracy and the growth of government
  - Budget-maximizing bureaucrats: Niskanen (1971) postulated that a bureaucrat’s "salary, perquisites of the office, public reputation, power [and] patronage" are all positively related to the size of the bureau.
  - Government Agency: The lack of information available to voters. The imperfect information of voters enables the government to grow larger by increasing the tax burden. Mill (1861) felt that direct taxes were more visible and, by implication, that excessive government growth would have to rely on indirect taxes. The issue of what sources of revenue are less visible to citizens, as well as the magnitude of any fiscal illusion caused, must be regarded as largely empirical.
  - Corruption: Predatory regulation. The government intentionally creates regulations that entrepreneurs have to pay bribes to get around. Goel and Nelson (1998) use convictions for public abuse of office as an index of corruption, and find that corruption at the state level in the United States increases with the size of state governments.
FIGURE 1.1. Income inequality in the United States, 1910–2010

The top decile share in US national income dropped from 45–50 percent in the 1910s–1920s to less than 35 percent in the 1950s (this is the fall documented by Kuznets); it then rose from less than 35 percent in the 1970s to 45–50 percent in the 2000s–2010s. Sources and series: see piketty.pse.ens.fr/capital21c.
Theorem 1 (First Theorem of Welfare Economics) The allocation of commodities at a competitive equilibrium is Pareto-efficient.
**Theorem 2** (Second Theorem of Welfare Economics) With convex preferences, any Pareto-efficient allocation can be made a competitive equilibrium.

The only special feature of $e$ is that it is the allocation reached through competitive trading from the initial endowment point $\omega$.

If $\omega$ were different, then another Pareto-efficient allocation would be achieved. There is in fact an infinity of Pareto-efficient allocations.

Observing these points motivates the Second Theorem of Welfare Economics.
Total expenditure, 1870 to 1996 (% GDP)
Figure 3.3
Individual expenditure items (% GDP)
**Revenue box.** The revenue received by the monopolist is just the price times the quantity, which can be interpreted as the area of the box illustrated.