

Welfare and Economic Policy Analysis - An Introduction: Lecture I

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The Big Picture

- Burning fossil fuel contributes to greenhouse gases which may affect the climate - One response is to put a tax on fossil fuels to reduce the level of greenhouse gases emitted.
- This would reduce the amount of fuel produced and consumed as well as the overall price of that fuel (oil).
- This reduction would affect the producers of oil both domestically and internationally.
- This domestic/international effect could have additional effects:
 - The reduction in the production of oil could reduce the environmental damages due to oil spills.
 - Different countries may have different values of environmental damages.

Just, Hueth, and Schmitz p. 1

- Suppose that you are an economist and are asked to provide expert testimony to a congressional committee regarding these policies. Which, if any, policy would you support? What would be the economic basis for your testimony? Is there an objective theoretical justification for either policy? How would you go about calculating the expected gains and losses from these proposed policies? One must bear in mind that public officials must and will make these decisions whether or not they can get objective advice.

Positive Versus Normative Economics

- **Positive economics** is the branch of economics that is concerned with understanding and predicting economic behavior.
 - The propositions of positive economics follow logically from axioms and assumptions about consumer and producer behavior, technology, and available resources.
 - The theoretical parts of positive economics, insofar as they possess empirical implications, provide hypothesis that can be tested statistically.

- **Welfare economics**, on the other hand, is concerned with what 'ought' to be.
 - Welfare economics focuses on using resources optimally to achieve the maximum well-being for individuals in society.
 - As with positive economics, the propositions of welfare economics are also logical deductions from a set of definitions and assumptions but the assumptions of welfare economics are fundamentally different from those of positive economics.

- Two ethical assumptions that are widely accepted and provide a foundation for welfare economics and policy evaluation:
 - 1 The welfare status of society must be judged solely by the members of society, which recognizes the traditional importance of the individual in Western society.
 - This is sometimes called the **fundamental ethical postulate** or principle of **individualism**. (Quirk and Saposnik, 1968).
 - 2 The notion that society is better off if any member of society is made better off without making anyone else worse off.
 - This is known as the **Pareto Principle**.
- A second difficulty with welfare economics is that economic 'welfare' is not an observable variable like the number of machines, houses, market prices or profits.
 - A basic proposition of utility theory in positive economics is that utility increases as the amount of goods consumed increases.
 - The basic question raised in welfare analysis is by how much?

Cardinal Versus Ordinal Utility

- Buried in our theory is a conceptualization of utility. Early applications in economics posited a *cardinal* utility function - one in which we could measure the amount of utility generated by any bundle of consumption - utils of pleasure.
- The marginalist revolution in economics (i.e., Marshall) reformulated our approach slightly hypothesizing an ordinal approach to utility - the it was only necessary for out utility function to tell us whether one bundle is preferred to another.
 - It was only necessary for $U(x_1) > U(x_2)$ to determine that $x_1 \succ x_2$.
 - However, $U(x_1) - U(x_2) = \Delta$ was not a 'meaningful metric.'
- Relying on the ordinal approach is going to lead us to a discussion of the Hicksian demand system - specifically, the expenditure function.

Some Controversies in Welfare Economics

- Welfare economics has a long history.
 - The concept of economic rents to the producer (the area between the market price and the supply [or marginal cost of production]) goes back to Ricardo (1829) which was used to examine the cost of 'corn laws' in England.
 - The concept of consumer surplus goes back to Dupuit (1844) who considered the value of building a bridge. Similar to producer surplus, consumer surplus is defined as the area between the demand curve and a market price.

- However, we typically make a distinction between *old welfare economics* and *new welfare economics*.
 - Old welfare economics based on utilitarianism, which accepted both cardinality of utility and interpersonal comparisons of utility.
- New welfare economics rejected both the cardinality of utility and interpersonal comparability.

Cardinal Utility

- Economists such as Paul A. Samuelson demonstrated that the basic welfare measure of old welfare theory (consumer surplus) was not well defined.
 - Samuelson, P.A. (1942) Constancy of the Marginal Utility of Income *Studies in Mathematical Economics and Econometrics in Memory of Henry Schultz* Eds Lange, O., McIntyre, F. & Yntema, T.O. Chicago: University of Chicago Press, 75 - 91.
 - Silberberg, E. (1972) Duality and the Many Consumer Surpluses *American Economics Review* 62(5), 942-952
- Consumer surplus is not generally a unique measure of utility, and nonuniqueness can imply contradictions depending upon the empirical use of data.

Cardinal Utility - Continued

- These arguments are somewhat offset by the work of Robert Willig:
 - Willig, R.D. (1973) *Consumer's Surplus: A Rigorous Cookbook* Technical Report No. 98, Stanford, CA: Stanford University Press: Institute for Mathematical Studies in Social Sciences.
 - Willig, R.D. (1976) Consumer's Surplus Without Apology. *American Economic Review* 66(4), 459-74.
 - McKenzie, G.W. (1979) Consumer's Surplus Without Apology: Comment *American Economic Review* 69(3), 465-468.
 - Willig, R.D. (1979) Consumer's Surplus Without Apology: Reply *American Economic Review* 69(3), 469-474.
 - Shonkwiler, J.S. (1991) Consumer's Surplus Revisited *American Journal of Agricultural Economics* 73(2), 410-414.

Pareto Principle

- The **Pareto Principle** states that society can only be said to be better off if one individual is made better off without making any other individual worse off. These are the only policy actions that can be supported on objective grounds.
- This concept was elaborated on by Kaldor and Hicks who extend the basic formulation by hypothesizing that the welfare weights of different individuals could be different.
 - Kaldor, N. (1939) Welfare Propositions of Economics and Interpersonal Comparisons of Utility *Economic Journal* 49(195), 549-552.
 - Hicks, J.R. (1939) The Foundations of Welfare Economics *Economic Journal* 49(196), 696-712.

Compensation Principle

- Kaldor and Hicks introduced the **compensation principle** by which a change should be made if a Pareto improvement can be made by some redistribution of goods or income following the change so that at least one individual is better off and no one is worse off. This has become known as the *compensation criteria*.
- The associated measurement problem was addressed by Hicks (1943) who suggested that alternative money measures of welfare, while not directly related to utility gains and losses, can be given willingness-to-pay interpretations.
 - Hicks, J.R. (1943) The Four Consumers' Surpluses *Review of Economic Studies* 11(1), 31-41.
 - Hicks, J.R. (1956) *A Revision of Demand Theory* Oxford: Clarendon Press.

Reversal Paradox

- De Scitovsky (1941), in what has become known as the *reversal paradox*, illustrated how inconsistencies can occur when using the compensation principle.
 - Basically, the values of the surplus and implied compensations are a function of the initial condition.
 - Suppose that we start by moving from point A to point B . Further suppose that this movement is consistent with the compensation principle so that group 1 gains from this move and could compensate group 2 for their loss.
 - However, once we move from A to B , assume that we analyze a reversal in the policy (i.e., a move from B to A). It is possible that this move would also meet the compensation criteria – group 2 would gain enough to compensate group 1 for its losses.
 - De Scitovsky, T. (1941) A Note on Welfare Propositions in Economics, *Review of Economic Studies* 9(1), 77-88

Compensation in Welfare Economics

- The Scitovsky paradox was resolved by the adoption of the double criterion of Scitovsky which stated that policy B is preferred to policy A only if the gainers can compensate the losers when making the change and the losers cannot bribe the gainers into not making the change.
- This potential compensation criteria was further broadened by Samuelson (1947, 1956), who compared all possible prices and income distributions of the outcome associated with policy A .
 - Samuelson, P.A. (1956) Social Indifference Curves *Quarterly Journal of Economics* 70(1), 1-22.
- The word 'potential' is critical here because policy B is preferred to policy A as long as it is **possible** for gainers to compensate the losers – not only when the gainers actually compensate the losers.

- **The principle is based on potential compensation only.**
- Supporters of the principle of potential compensation argued that the actual payment of compensation (for example, by the gainers to losers when moving from policy *A* to policy *B*) involves a value judgment.
- If society has a high regard for the individual made worse off and a low regard for the individual made better off (perhaps because one is poor and the other is rich), the society as a whole may be worse off by the change.
- Schmitz, A. & Seckler, D. (1970) Mechanized Agriculture and Social Welfare: The Case of the Tomato Harvester *American Journal of Agricultural Economics* 52(4), 569-77.

Compensating and Equivalent Variations

- The two most widely used willingness-to-pay welfare measures propose by John R. Hicks (1943, 1956) are the *compensating variation* and the *equivalent variation*.
- The motivation for Hicksian measures is that *an observable alternative for measuring the intensities of preferences of an individual for one situation versus another is the amount of money the individual is willing to pay or willing to accept to move from one situation to another.*
- This principle has become a foundation for modern applied welfare economics and, in particular, is a foundation for the methodology developed in Just, Hueth, and Schmitz.

- Because these WTP measures are often approximated by consumer surplus, the triangle-like area behind the demand curve and above the price line, the subtleties of the difference in old and new welfare economics should be clearly understood.
- The two most important WTP measures are compensating and equivalent variations.
 - *Compensating variation* is the amount of money which when taken away from an individual after an economic change leaves the person just as well off as before.
 - *Equivalent variation* is the amount of money paid to an individual which, if an economic change does not happen, leaves the individual just as well off as if the change occurred.

Efficiency and Equity

- Almost without exception, the great works in economics have focused on some aspect of the operation of the economy in terms of such criteria as efficiency and equity.
- *Economic efficiency* has to do with producing and facilitating as much consumption as possible from available resources, whereas *equity* has to do with how equitably goods are distributed among individuals.
- Any given set of resources and ownership of those resources will imply an efficient solution, and distribution of rents (consumer surplus and returns to factors of production).
- However, it is possible for the economy to be efficient, but miserable.

Equity

- There is a contention that more equitable distributions are preferred to less equitable distributions.
- The choice of income distribution, however, is a political matter that can be solved only by value judgements through the political process.