



PH- 3915

Methods for the Economic Evaluation of Health Programs

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Course Objectives

- ✦ Concepts and methods for the economic analysis of health care decision alternatives.
 - CEA cost-effectiveness
 - CBA cost-benefit
 - CUA cost-utility analysis
 - BIA budget impact analysis
 - Other economic analysis methods.
- ✦ Emphasis is on the application of these methods to the evaluation of alternative health programs. As a result of this course, students will be able to:



Course Objectives

- Understand and describe the conceptual bases and the application of CBA, CEA, CUA, and BIA studies and the analysis of price elasticity of demand in the health sector.
- Identify the types of programs to which each of these are applicable.
- Identify the value and the limitations of the results of these analyses.



Course Objectives

- Develop a proposal for an economic evaluation of a health program or health policy.
- Critically review economic appraisals of health programs and policies.

✿ Additional Objectives

- Understand how market systems determine values
- Understand the problem of market failure



Advice

★ **Students from PH-3910 (intro to health econ).**

- This course is less theoretical than PH 3910, which provided the theoretical foundation for CBA and CEA.

★ **New students- some economics background.**

- Review your basic microeconomic concepts and terminology especially with regard to price determination and supply and demand analysis.

★ **New students- no economics background.**

- Obtain a principles of economics book and/or subscribe to **econweb.com** to learn microeconomics.

Advice

- ✦ Heilbroner, R.L. and J.K. Galbraith. Understanding Microeconomic Eighth Edition, Prentice Hall, Englewood Cliffs, N.J. 1987.
- ✦ Dolan Edwin G. *Microeconomics, 7th Edition*, 2022. (on reserve in UTSPH library)(chapters 1 through 4)
- ✦ <http://www.econweb.com>
 - Online animated text (free until existing version is updated)



Level of Difficulty

1. Readings (highly technical) .

- The book and readings are technical and must be worked through rather than just read. Read more than one time and take notes in preparation for the exam and class discussions.

2. Mathematics.

- Understanding of basic algebra (e.g. Summation signs and linear equations) is all that is necessary for most of the analyses.

Level of Difficulty

3. Statistics & research design .

- Statistical concepts and methods are applied for analyzing uncertainty in economic evaluation studies.
- Research design issues are relevant for developing evidence of program effectiveness and costs.
- Most applications of CBA and CEA use a combination of knowledge and methods from several disciplines including economics, statistics, epidemiology, and behavioral science.



Requirements/ Assessment

★ Quiz September 28

- Closed book.
- Review lectures and required readings.

★ Final Exam Nov. 21

- Closed book
- Review quizzes, lecture slides, readings, problems.

Requirements/ Assessment

✶ Economic evaluation proposal.

- **One-page abstract** or detailed outline due **Oct. 21**
- **Full 12-15 page** proposal (with properly documented references) **uploaded to CANVAS by Dec. 2**
- Main Elements of Proposal for an economic evaluation
 - Statement of the problem & brief summary of background literature
 - Study (cost) perspective
 - Specific aims
 - Description of the alternative interventions/ programs
 - Methods
 - Study Design and Data sources
 - Cost measurement; Effect Measurement; Decision Criteria; Analysis of Uncertainty; Limitations
 - Mock tables showing how the results would be presented to decision-makers (see more details at the back of the course syllabus)



Materials (syllabus)

Textbook

- Drummond, M.F., Sculpher, M.J., Claxton, K, Stoddart, G.L., Torrance G.W., Methods for the Economic Evaluation of Health Care Programmes. Fourth Edition, Oxford University Press, 2015.

Journal Articles

- The starred (*) articles are required readings available on CANVAS.

Web

- See relevant links on CANVAS & hyperlinks on slides



Software/ Methods Sessions

✦ Oct. 20 **Net benefit regression analysis**

– Lynda Yueh-Yun Lin/ Dr. Rajan

✦ Oct. 25 & Oct. 27 **Cost-Effectiveness Analysis Lab Sessions**

– Dr Rajan

- TreeAge Pro Healthcare (1 semester limited license) will be purchased for all students for learning the basics of the decision analysis software.

✦ Nov. 1 **Budget Impact Analysis**

– Dr. Paul G. Yeh



Questions?



Introductory Lecture: The Importance of Markets in Economic Evaluation

Suja S. Rajan, PhD



Rationale for Economic Evaluation

- ✦ Resources are **scarce** and therefore we must make choices regarding their allocation.
- ✦ By applying techniques of **rational** decision-making, we can move toward achievement of maximum **value** obtained from our limited resources.

Definition of Economics

- ✱ Economics is the study of how society allocates its scarce resources to the production of goods and services and then distributes those goods and services among members of the society.
- ✱ Economics is not just a study of money/costs. It is a study of behavior at a micro (individual) and a macro (countries/states) level.
 - How does behavior change in response to incentives, interventions and policies?



Basic Constraint of Nature

Scarcity.

- At any moment in time, there are not enough resources to produce all the goods and services desired by society.



Implications of Scarcity

- ✦ Choice: given limited resources, society must decide what goods and services it wants to produce.

- ✦ Opportunity costs are the benefits foregone by producing one set of goods and services rather than the next best alternative.

Given limited resources, when we choose to produce one set of things, we forego other things that we could have produced with the same resources.



Private Versus Social Choice

- ✱ How do we decide what to produce, how, how much and for whom?
- ✱ The free market versus the regulated public/government decision making
 - The left versus the right extremes of economic policy, politics and decision making




Market

✱ In a typical market: The actual allocation of resources is the result of complex interaction between producers and consumers in the private market and regulations/decisions by public officials and bodies.



Private Choice - Market



Free market: Market forces of supply and demand and the individual actions of producers and consumers, weighing the cost and benefits of buying and producing decisions, control resource allocation in the **private sector**.

Economic Evaluation & Private Markets

- ✱ Markets may **fail** to establish efficient prices, causing misallocation of resources.
- ✱ CBA, CEA, CUA can **guide** decision-makers resource allocation choices based on a “full” assessment of costs versus benefits.
- ✱ Ironically, the private market system is the **best source of most resource values** (prices) for economic evaluation.
- ✱ The *pharmaceutical sector is most reliant on* economic evaluations for investment, production, & purchasing decisions; including a sub-discipline of **pharmaco-econ.**
 - **ICER (Institute for Clinical and Economic Review)**

Social Choice - Government

✶ Government Agencies

- Determine **how much** spending should be public, the **mix** of public goods and services, and
- How those public goods and services are to be produced and/or regulated.

✶ Economic evaluations provide feedback to assist decision-making.

- UK has the National Institute for Health and Care Excellence (NICE) www.nice.org.uk
- US government agencies such as CMS, CDC, and VA use economic evaluation methods.

Roles of the Government

✱ **Macro:** By adjusting government spending, taxation, money supply, interest rates, financing, and trade regulations, the government attempts to achieve stable economic growth, low inflation, and high employment.

✱ **Micro:** By regulation of prices and production methods or public production, the government attempts to correct market failure to achieve maximum achievable social welfare.

The Market System (Supply and Demand)

- How are markets the best sources of values for CEA, CBA and CUA ?
 - The choices of buyers and sellers within markets determine the allocation of resources and the relative prices of goods and services.
- Consumers constitute the demand side of the market and producers constitute the supply side.



Demand

- ✦ The amount of goods consumers are willing and able to purchase at alternative prices.
- ✦ Consumers constrained by their income and prices, try to maximize utility (well-being) by purchasing a set of goods and services during each period of time.

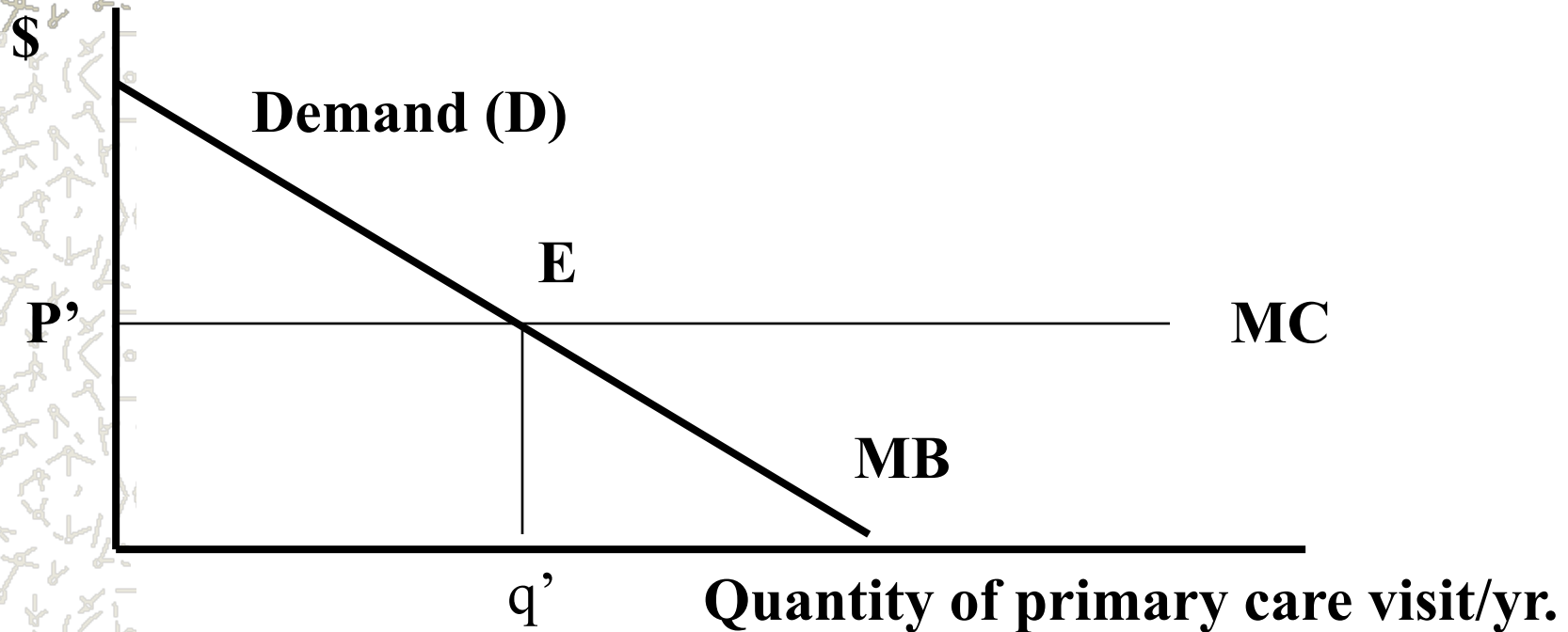
Elements of Demand

$$Q_d = f(P, P_{\text{other}}, I, \text{Pref/Utility})$$

Where:

- Q_d = Quantity demanded (e.g. primary care visit/yr.)
- P = price of the service
- P_{other} = prices of other services
- I = consumer's income
- Pref/Utility = consumer's preferences

Demand Slopes Downward

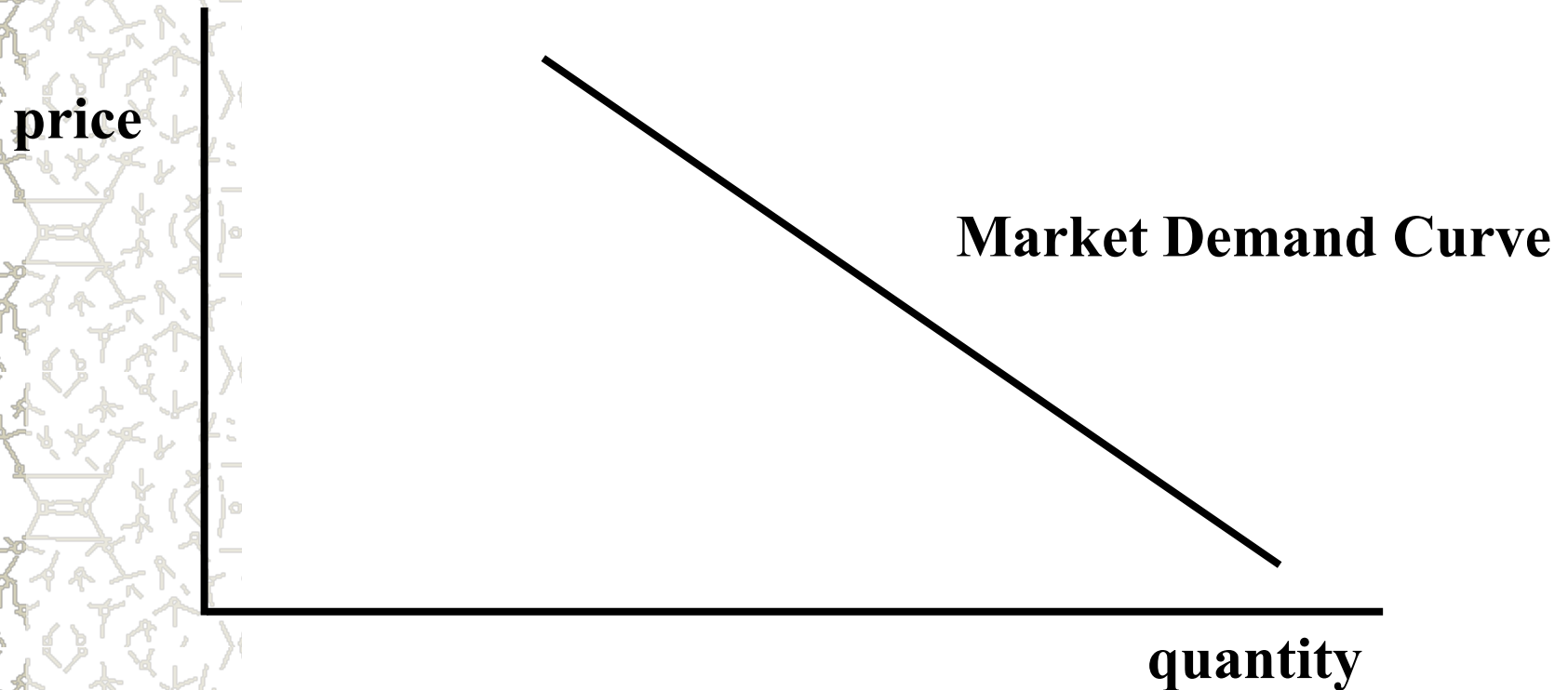


Lower price:

- enables consumer to buy more services (**income effect**)
- service is less costly relative to substitutes, e.g. alternative medicine (**substitution effect**)
- marginal benefit of service falls as more primary care is consumed

Market Demand:

Aggregation of Individual Demand
Curves in a Market Forms the Market Demand for a Service





Supply

- ✱ The amount of services producers are willing and able to sell at alternative prices.
- ✱ Producers attempt to sell that amount of a services that maximizes their profits subject to technology and input price constraints.

Elements of Supply

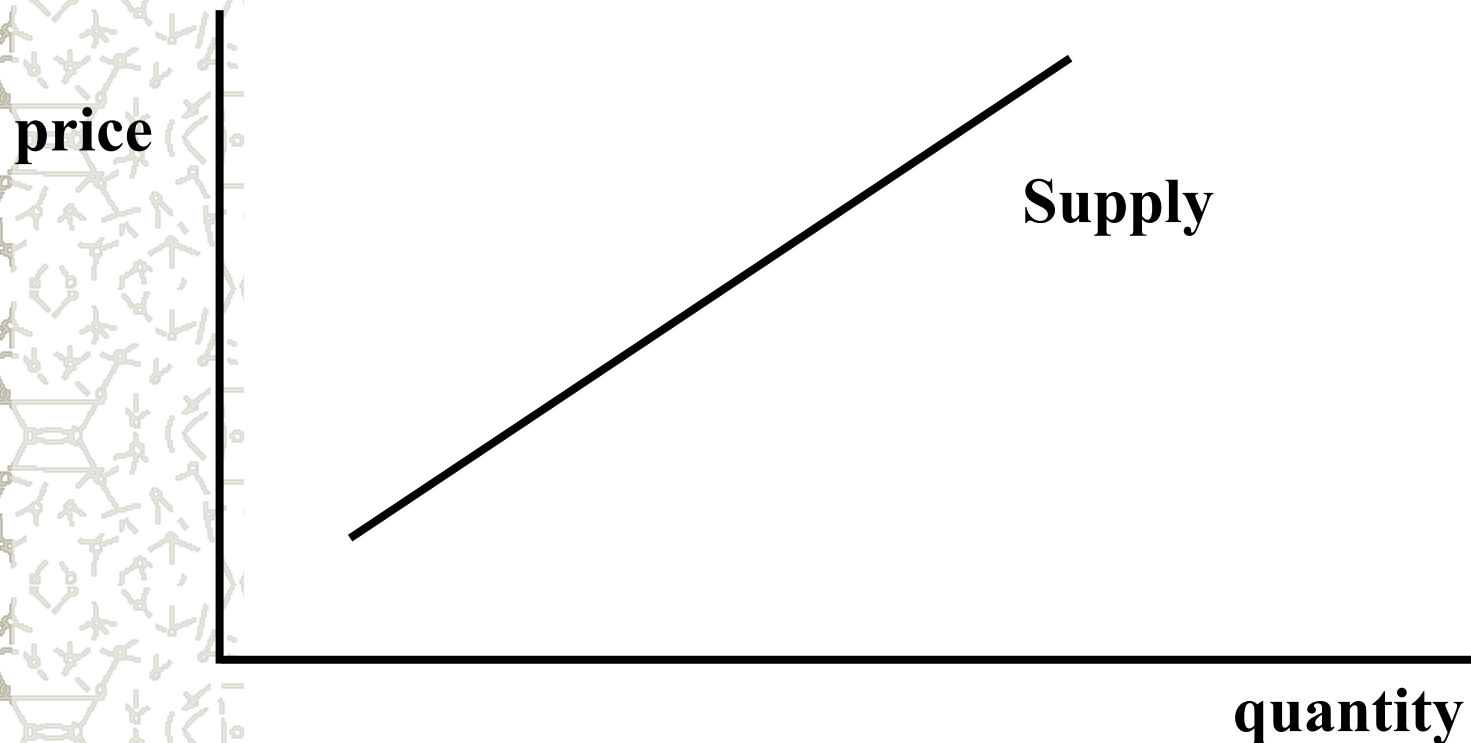
$$Q_s = f(P, P_{other}, T, f_1, \dots, f_n)$$

✶ Where:

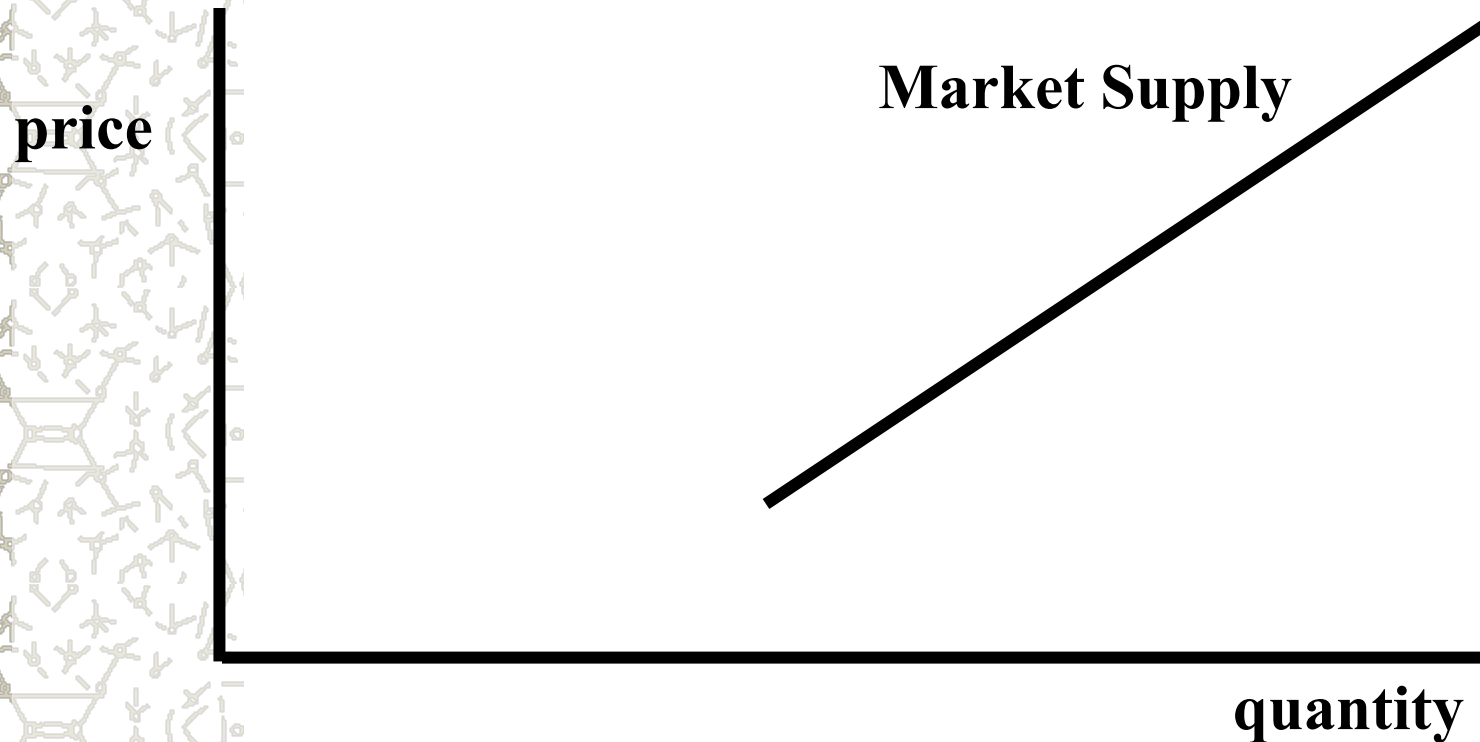
- Q_s = quantity supplied, e.g. primary care visit/yr.
- P = price of the service (**determined by mkt. S & D**)
- P_{other} = prices of other services, e.g. alternative med.
- F = prices of factors of production, e.g. staff wages
- T = technology, e.g. telemedicine infrastructure.

Supply Slopes Upward

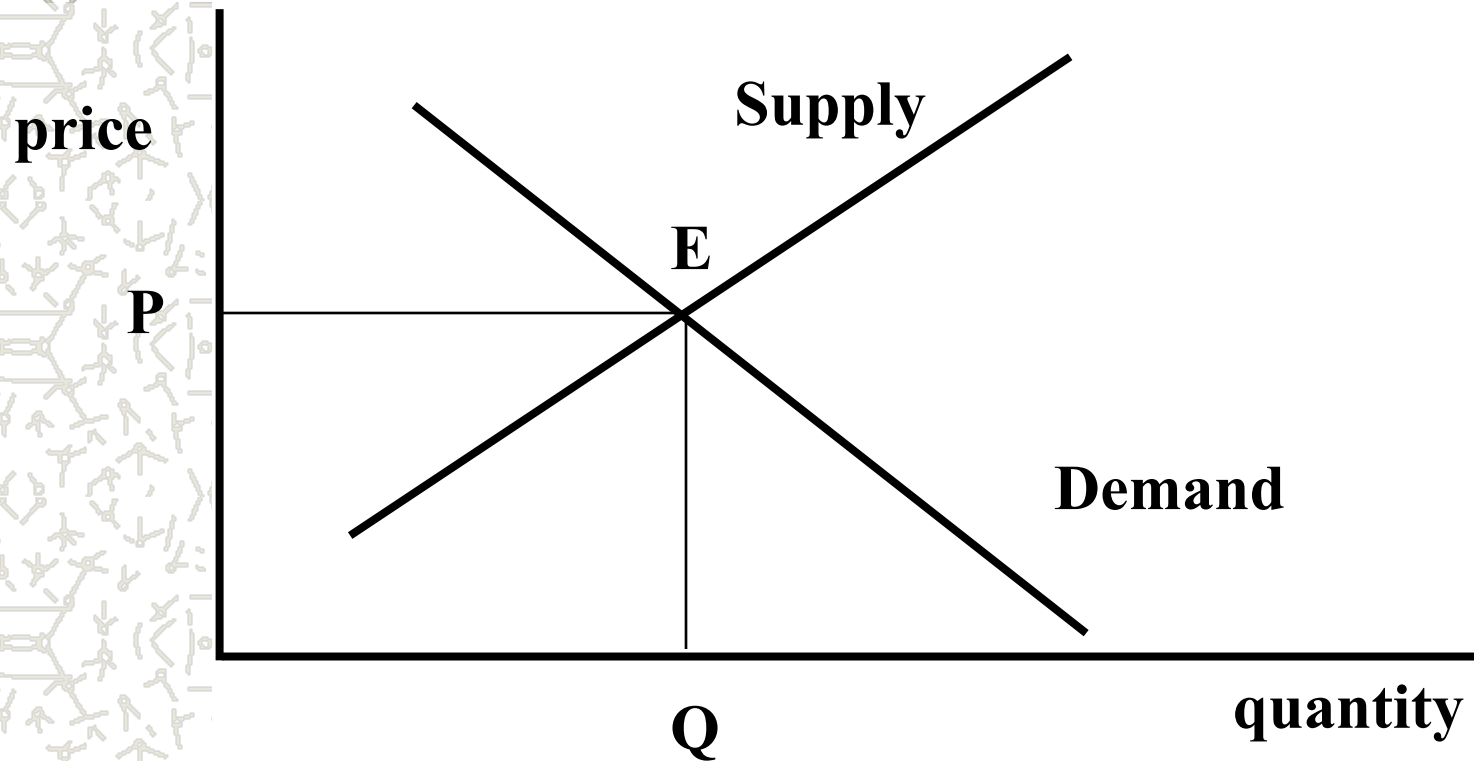
- Marginal costs rise with output
- Producer willing to devote more time and resources at higher prices



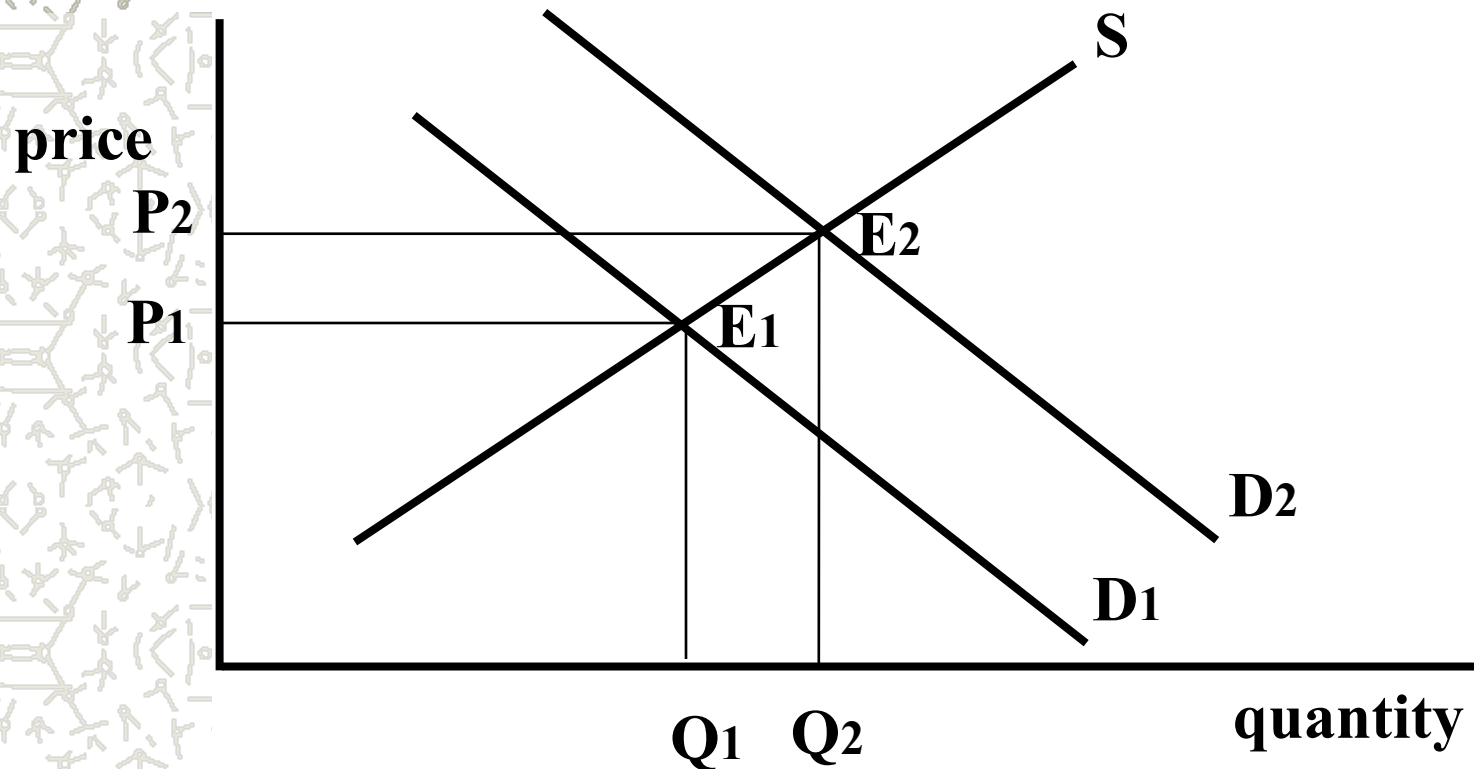
Market Supply: Aggregation of Individual Supply Forms
the Market Supply for a Given Service



Market Forces of S & D: Determines the equilibrium Market Price and Quantity



Market Dynamics: An increase in demand raises the equilibrium market price and quantity



Change factors in the demand function and/or the supply function and predict the effect on market price and quantity. For example, in this case consumer income has increased in the market.



Comparative Statics

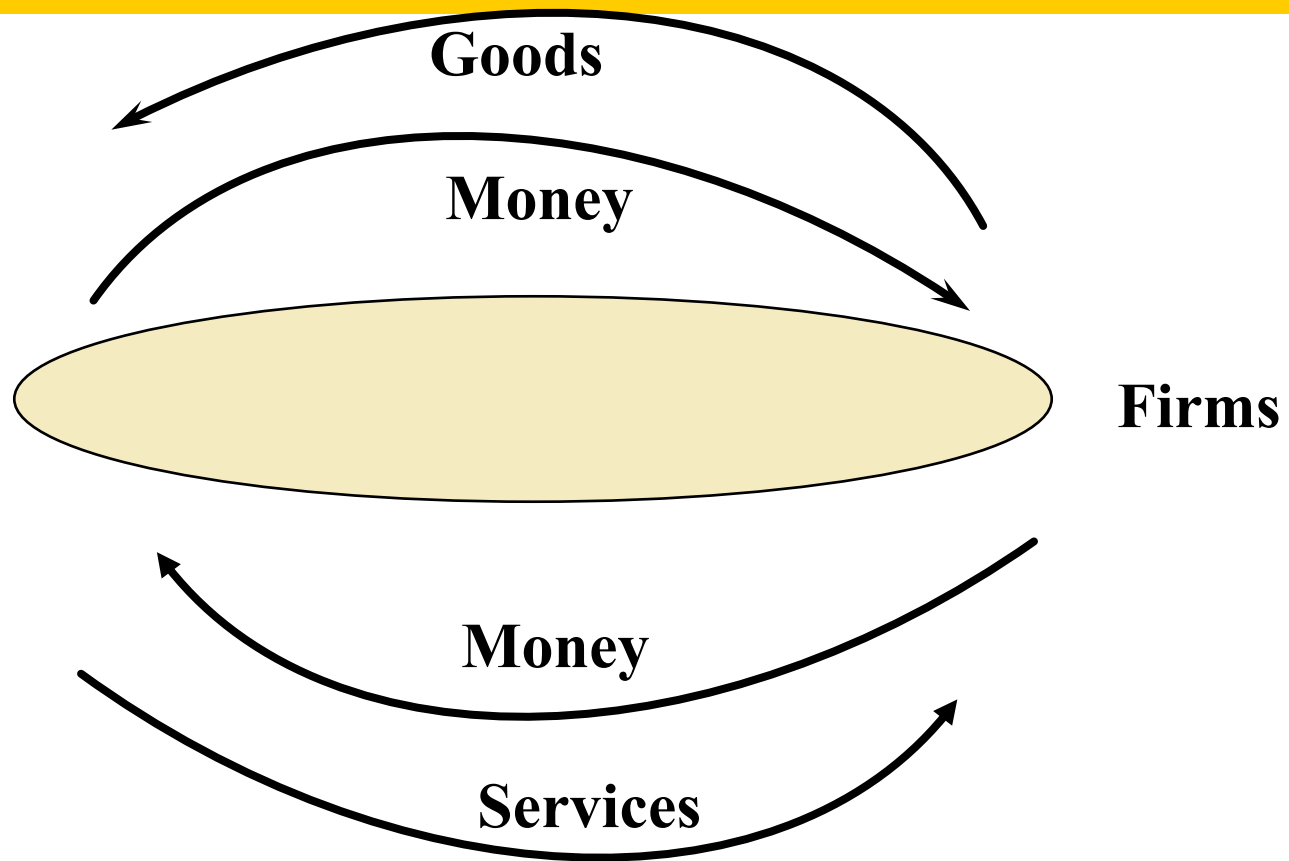
- What happens to equilibrium price and quantity when there is
 - Increase in consumer income?
 - Increase in input/ factor prices?
 - New technology that improves productivity?
 - Change in consumer preferences toward other products?



Market System

Thousands of interrelated markets determine resource allocation and incomes for the entire economy and much of the world

Circular Flow of Goods and Money





Advantages of “Free” Markets

- Rapid adjustments to changes in conditions
 - Consumer preferences (needs/ illness patterns)
 - Income
 - Resource scarcity
 - Technological change (telemedicine)
- Consumers control resource allocation
- Producers rewarded for efficiency
- Can lead to a social optimum



Disadvantages of “Free” Markets

- ✚ Monopoly power distorts prices & resource allocation

- Producer monopoly and oligopoly
- Worker monopoly of an industry by unions

- ✚ Externalities

- Markets may not account for effects on 3rd parties (global warming is an extreme case).

- ✚ Distributional Issues

- Markets may lead to highly skewed income and wealth resulting in social & political instability.



Summary

- ✱ Society must allocate scarce resources among competing uses.
- ✱ Economic evaluation methods help clarify the alternative uses of resources and their relative costs, benefits, and effects.
- ✱ The market system is a social system that determines the values of goods, services, and resources in a market economy.
- ✱ Market values (prices) provide weights for valuing resources in economic evaluation studies.