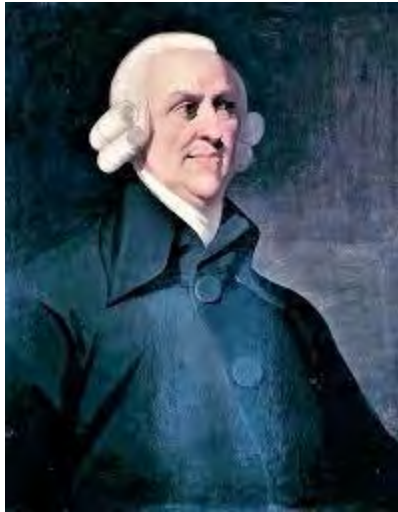


Introduction to Economics: Background and Foundations

Economics Principles: Foundations of Economics

Economics as a Field: **Economics** is defined as the study of the choices people make to attain their goals, given their scarce resources. Scottish social philosopher **Adam Smith** is widely known as the father of economics, beginning the study with his publishing of *The Wealth of Nations* in 1776, a collection of economic thoughts that advocated for free markets governed by the “invisible hand.” The **invisible hand**, as theorized by Smith, was a force that directs markets to their best and most efficient outcomes.



Adam Smith, the author of “The Wealth of Nations”

Economics can be divided into two fields:

- **Microeconomics:** Microeconomics is the study of how households and firms make choices and how they interact in markets, as well as how the government attempts to influence their choices. Another concern is how individual markets function.
- **Macroeconomics:** Macroeconomics is the study of the economy as a whole, including topics such as inflation, unemployment, and economic growth. Macroeconomic policy encompasses fiscal and monetary policy.

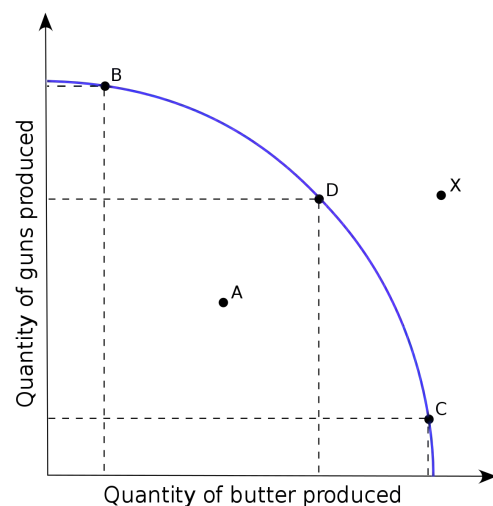
Scarcity: **Scarcity** is a situation in which unlimited wants exceed the limited resources available to fulfill such wants. This is a naturally occurring phenomenon that derives from the limited nature of the world’s resources and is not considered a market failure. This is not to be confused with a **shortage**,

which is a scenario in which the quantity demanded is greater than the quantity supplied which occurs when the market price is less than equilibrium, which is a market failure. Scarcity is considered to be one of the fundamental concepts of economics.

The concept of scarcity extends to another, known as **production possibilities frontier (PPF)**, a curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology. The PPF considers all available input to determine which are **efficient**, meaning which use all possible available input.

The input of the PPF are known as **factors of production**, or **resources**. The four of these are:

- **Land and natural resources:** Resources that are naturally occurring, such as wood, plants, and oil



- **Labor:** The effort and time workers put in
- **Physical capital:** Non-naturally occurring resources, such as machinery
- **Human capital:** Human knowledge and experience, such as college education

It is important to note that money or financing is not considered a “resource” as it is channeled into other resources. **Output** is *input combined with technology and government*.

A second adaptation of scarcity is **opportunity cost**, which is *the highest-valued alternative that must be given up to engage in an activity*. Everything that is done has an opportunity cost. This can be calculated through calculating the slope at a certain point along the curve between two points. Opportunity cost is what shapes most PPF to be “bowed-out” as opposed to linear. This is a result of the **law of increasing opportunity cost**, meaning that *allocating more resources to one good takes more away from the other good the more of the first good that is created*. This means that the slope of the PPF gets increasingly steep.

Rationality: An assumption that economists make is that people are **rational**, meaning that *they do what is best for them in their own opinion*. While many people do things that are bad for them in the long run, they do these things because they believe their benefit to outweigh any costs they may incur. This satisfies conditions for rationality. Rationality is what drives people to respond to economic incentives.

Margins: Another important concept to economics is that the best decisions are made at the **margins**, meaning *at every additional unit*. The **marginal benefit** is the *additional benefit to consumers from consuming one more unit of a good or service*, while the **marginal cost** is *the additional cost to firms of producing one more unit of a good or service*.

Analysis: There exist two types of analysis in economics:

- **Positive Analysis:** Economic analysis that is concerned with what is testable and true
- **Normative Analysis:** Economic analysis that concerns what should happen

Normative analysis is largely subjective and deals with the trade-offs between equity and efficiency. **Equity** is *what is the “fair” distribution of economic benefits*, while **efficiency** is *society getting the most it can out of its resources*. Equity and efficiency trade off from each other, but there is societal consensus that some degree of assistance should be given to the most vulnerable members of society, even if this harms efficiency.

There also exist two types of efficiency:

- **Productive efficiency:** The state in which a good or service is produced at the lowest possible price
- **Allocative efficiency:** A state of the economy in which production is in total accordance with consumer preferences

Allocative efficiency is achieved when the marginal benefit equals the marginal cost.

Core Questions of Economics: With all of these fundamental concepts, there exist three core questions that economists ask when considering markets:

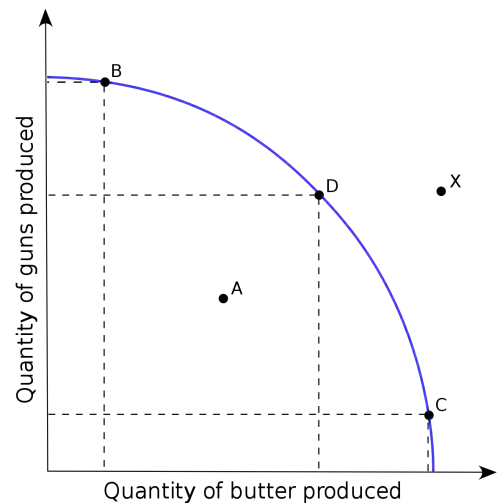
1. What do we produce?
2. How do we produce it?
3. Who gets it?

* * *

The Production Possibilities Functions: Scarcity and Opportunity Cost

Efficiency: The PPF is used to not only illustrate the relationship between the production of two goods, but also what combinations are possible and efficient. All points along the curve itself is considered to be **efficient**, as all resources are being used to their fullest extent. When all resources are not being used, the situation is **inefficient**. Any point in the area between the axes and the curve represents efficiency. Points beyond the curve are impossible, as there are not enough resources to create this.

The graph on the right is a production possibilities curve, where B, D, and C are all efficient, A is inefficient, and X is impossible.



A guns-and-butter production possibilities curve

Economic Growth: PPFs can also be used to measure

economic growth. When a PPF curve shifts to the right, this indicates economic growth, whereas a shift to the left indicates economic contraction. Economic growth can be seen in the increased possibility of either both goods or in one good with no change in the other. Economic growth can be generated through advancements in artificial technology or improved livelihood. **Economic growth** can be defined as more output with the same input.

There is a distinction to be made between growth and **increased inefficiency**, the latter of which is a shift of a point from the area underneath the curve to a more efficient point. Growth occurs when the curve itself shifts.

Supply, Demand, and Equilibrium: Functions of Markets

Demand: The Law of Demand

*The Law of Demand: Demand is the relationship between the price of an item and the quantity demanded. This can be articulated in two formats: a schedule or a curve. A **demand schedule** is a table that shows the relationship between price and quantity demanded, while a **demand curve** shows the same as a table, but in the format of a graphical function.*

The **Law of Demand** stipulates that there is an inverse relationship between price and quantity demanded, establishing a downward sloping demand curve. This means that as the price decreases, people demand more. This is a result of three things:

1. **The Substitution Effect:** The substitution effect is when changes in price motivate consumers to buy relatively cheaper substitute goods. This means that if the price of one good decreases, people will buy more, as this good will be a less expensive substitute to other similar goods. Conversely, if the price increases, then people will buy less, as they will prefer other (less expensive) goods.
2. **The Income Effect:** The income effect is when the purchasing power of buyers changes when the price of goods change. When purchasing power increases, then people will purchase more of something, and vice versa.
3. **The Law of Diminishing Marginal Utility:** The Law of Diminishing Marginal Utility states that as you consume a given product, you eventually get less utility for each unit you consume. Utility, here, should be thought of as satisfaction with a good or service. This means that people will not buy an endless amount of something, as they will not get satisfaction from it after a certain point.

Changes in Demand: Given that demand is the relationship between quantity demanded and price, a change in price causes a shift *along* the demand curve. However, anything else will result in a shift *of* the demand curve, meaning that people will buy more or less of a good, no matter the price. A shift is called an increase or decrease in demand.

Factors that result in shifts in demand are known as **demand determinants**, which are:

1. **Tastes and preferences:** If a society views a product favorably, then demand will increase, and if a society views it unfavorably, demand will decrease.
2. **Number of consumers:** Having an increasing number of buyers increases demand, while a depleting number of buyers decreases demand.
3. **Price of related goods:** If the price of substitute goods goes up, then demand for a good will increase, while if the price of substitute goods goes down, then demand will decrease. Additionally, if the price of complementary goods goes up, then demand will decrease, and if the price of complementary goods goes down, the demand will increase.
4. **Income:** If a good is a normal good, then demand will increase and decrease with changes in income. However, if a good is an inferior good, then demand will increase and decrease inversely with income.
5. **Expectations:** If people believe that the price of a good will increase in the future, demand is going to increase on the day of purchasing. Conversely, if people believe that

the price of a good is going to decrease in the future, then demand decreases on the day of purchasing.

Elasticity of Demand: Elasticity (ϵ) is defined as *the effect of one variable in the economy on another as a result of change*. This is adapted to the concept of demand with the **elasticity of demand**, which is *the effect price has on the quantity demanded*. This is represented through the coefficient of elasticity, and can be calculated using the following formula:

$$\xi_d = \frac{\% \Delta Q_d}{\% \Delta P}$$

Given the Law of Demand, the coefficient will always be negative. In order to classify demand, we must look at the absolute value of the coefficient. There are three types of goods:

- **Elastic goods:** Elastic goods are *goods with demand that are sensitive to price changes*. To be classified as elastic, the percentage change in quantity demanded must be greater than the percentage change in price. Mathematically, a good is elastic when $|\xi_d| > 1$
- **Inelastic goods:** Inelastic goods are *goods with demand that are not sensitive to price changes*. To be classified as inelastic, the percentage change must be less than the percentage change in price. Mathematically, a good is inelastic when $|\xi_d| < 1$.
- **Unit-elastic goods:** Unit-elastic goods are *goods with demand that is directly proportional to price changes*. To be unit-elastic, the percentage change in quantity demanded must be equal to the percentage change in price. Mathematically, a good is unit-elastic when $|\xi_d| = 1$.

Steeper curves tend to be more inelastic while more gradual curves tend to be more elastic.

There exist two extremes of demand curves in terms of elasticity:

- **Infinitely Elastic:** When the slope of a curve is zero, meaning consumers will only buy the product at one exact price
- **Perfectly Inelastic:** When the slope of a curve is infinity, meaning consumers will buy the product at any price with no impact on quantity demanded

There are two formulas that can be used to calculate elasticity:

$$\text{Point Method: } \xi_d = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P_1}{P_1}}$$

$$\text{Midpoint Method: } \xi_d = \frac{\frac{Q_2 - Q_1}{\frac{1}{2}(Q_1 + Q_2)}}{\frac{P_2 - P_1}{\frac{1}{2}(P_1 + P_2)}}$$