Economics: Common Body of Knowledge Review

Background
The first of the modern Social Sciences, the discipline of Economics is rooted in Adam Smith’s 1776 publication *An Inquiry into the Nature and Causes of the Wealth of Nations*. This seminal work is generally referred to more simply as *The Wealth of Nations*.

Scarcity
The fundamental ECONOMIC problem confronting all societies is SCARCITY. Technically, scarcity means the condition of not being able to get all you want for free. Therefore, almost everything that anyone wants is scarce. Goods and services are scarce because the RESOURCES needed for production are limited.

Resource scarcity forces all societies to answer three fundamental economic questions: (1) WHAT TO PRODUCE; (2) HOW TO PRODUCE IT; (3) WHO GETS IT?

Economics, in a nutshell, is the formal study of how various societies go about answering these questions.

There are only three mechanisms available for accomplishing this task: (1) custom, tradition, and habitual ways of doing things handed down generation after generation; (2) central authority of government (rulers) which plans, coordinates and controls economic choices; or (3) private markets which coordinate the desires of consumers and producers under the auspices of the profit motive.

All real world ECONOMIC SYSTEMS are some combination of these three mechanisms. If the first dominates, we have a TRADITIONAL economy (e.g. a tribal community deep in the Amazon rain forest which has little to no contact with the “outside” world). If the second dominates, we refer to the resulting system as a COMMAND economy (e.g. Cuba). If the third dominates, we have CAPITALISM (e.g. U.S.A.).

The U.S. economy can be represented graphically as a CIRCULAR FLOW DIAGRAM, with 2 markets (the GOODS or PRODUCT MARKET, and the FACTOR or RESOURCE MARKET). There are 3 participants (HOUSEHOLDS, FIRMS, and GOVERNMENT). Households provide firms resources in order to produce final goods. Firms provide households the final goods. This is known as the “real” or “physical” flow. Firms provide households payments for the resources, and households provide firms payments for the final goods. This is known as the “money” flow. Government plays 2 roles in this economy: as an ACTOR and a REFEREE.

Opportunity Cost
Emanating from the inevitable condition of scarcity is the fundamental economic concept of OPPORTUNITY COST. Economics focuses on making choices and every choice necessitates a sacrifice. When a choice is made, the best foregone (sacrificed) alternative is referred to as the
opportunity cost that is incurred by the choice maker. The relevant choice maker can be any entity (e.g. an individual, a community, a nation).

Two often-used statements which incorporate the opportunity cost concept are: (1) “There Ain't No Such Thing As A Free Lunch.” (or its acronym “TANSTAAFL”); and (2) “You Can't Have Your Cake And Eat It Too.”

Production Possibilities Frontier (PPF)
To highlight the fundamental economic problem of scarcity and its necessary offshoot, Opportunity Cost, we can utilize a model consisting of a single two-dimensional graph like the one illustrated below.

Make particular note that the model illustrates a Trade-Off between two different types of OUTPUT, with quantities of each measured along the axes. In this model we see a choice between Consumer Goods (C) and Capital Goods (K). Consumer goods are used directly by individuals to satisfy wants. Capital goods are final products (e.g. machines, buildings, tools, equipment) which become inputs for the production of other final goods and services.

Three assumptions are made when generating a specific PPF: (1) the QUANTITY of resources is fixed, (2) the QUALITY of resources is fixed, and (3) TECHNOLOGY is fixed for the production period in question.

The PPF is composed of points, each point indicating a specific COMBINATION of consumer goods and capital goods which are POSSIBLE (e.g. point F indicates this economy is capable of producing 3 units of K goods ALONG WITH 39 units of C goods). Output combinations OUTSIDE the frontier (e.g. point B) are IMPOSSIBLE to achieve because of limited resources. Output combinations represented by points INSIDE the frontier (e.g. point A) are not preferred but may occur as a result of UNEMPLOYED resources or an INEFFICIENT allocation of resources.

OPPORTUNITY COSTS can be clearly illustrated in this model. For example, if capital good output (K) is increased from 3 to 4 units, consumer good output (C) must drop from 39 to 31 units. Therefore, the opportunity cost of the additional (4th) unit of K is the sacrifice of 8 units of C (39 - 31 = 8). Suppose K output is increased by one more unit, increasing from 4 to 5. As a result C output must decrease from 31 to 22 units, making the opportunity cost of the 5th unit of K an additional 9 units of lost C (31 - 22 = 9).

This phenomenon is referred to as the Law of Increasing Opportunity Costs and is the reason the PPF is a curve as opposed to a straight line. It is a result of the fact that the various scarce resources needed to produce all goods and services are not perfectly SUBSTITUTABLE (shiftable) from one type of production to another.
If any of the three assumptions are relaxed (e.g. the quantity of resources increases) then over time the PPF can shift outward (point B could become POSSIBLE in a future production period). Therefore, ECONOMIC GROWTH can be depicted as an outward SHIFT of the entire curve.

**Comparative Advantage**

A simplified version of the PPF can be used to illustrate the concept of COMPARATIVE ADVANTAGE. The simplification involves using a straight line PPF. The assumption of non-perfectly shiftable resources is dropped (this does no damage to the validity of the model for the purpose in question). Consider the model below which illustrates the PPFs for two countries (A and B) and two different goods (X and Y).

![Graph showing PPFs for Country A and Country B](image)

Make particular note that the SLOPES of the two PPFs are different (90/30 or 3/1 for country A and 160/80 or 2/1 for country B). No two countries or regions within a given country have precisely the same resource endowment and "level" of technology. The practical result of this is that the PPFs of different countries will have different slopes.

Now note that country B can potentially OUT-produce country A in BOTH goods (160 Y is greater than 90 Y and 80 X is greater than 30 X). In this case, we would say that country B has an ABSOLUTE advantage in both goods. However, the key to COMPARATIVE ADVANTAGE is to observe opportunity costs in each country.

The "real" cost (i.e. opportunity cost) of 1 unit of good X produced in country A is the sacrifice of 3 units of good Y. For country B, producing 1 unit of good X entails sacrificing 2 units of good Y. Therefore, the REAL cost of producing 1 unit of good X in country B is cheaper than it is in country A (2 is a smaller real cost than is 3). This gives country B a COMPARATIVE ADVANTAGE in producing good X. Conversely, consider the respective opportunity costs for producing a unit of good Y. In country A, each unit of good Y entails a sacrifice of 1/3 of a unit of good X (note that this ratio is the reciprocal of the slope). In country B, each unit of good Y produced means sacrificing 1/2 unit of good Y. Therefore, in REAL terms, country A produces good Y more cheaply than does country B (1/3 is a smaller real cost than is 1/2). Consequently, country A is said to have a COMPARATIVE ADVANTAGE in producing good Y.

The practical result of this is that if the two countries SPECIALIZE production toward the good for which each has a comparative advantage (good X in country B, good Y in country A) and then engage in MUTUALLY BENEFICIAL trade, the total output for this two-country model can be increased. In this example, country A would produce more of good Y than desired purely for domestic consumption and export some of it to country B. Country B would import good Y and be an exporter of good X.
The inevitable existence of Comparative Advantage is one of the primary reasons why economists, IN GENERAL, tend to be proponents of free trade.

**Supply and Demand**
Supply and Demand analysis is the very foundation of economics. DEMAND literally means the willingness and ability of someone to buy something. The major factors (variables) that determine Demand for some good or service (X) are:

1) the market PRICE of good X;
2) the income of potential buyers of good X;
3) the prices of other goods—these may be either SUBSTITUTES (something that would replace good X) or COMPLEMENTS (something consumed WITH good X);
4) consumer expectations;
5) advertising;
6) quality perceptions;
7) consumer tastes and preferences;
8) any other factors (e.g. season of the year, population demographics, etc.) which might be important (this is referred to in economics literature as the “Portmanteau” variable).

When PRICE is isolated by assuming “all other variables constant” (known as the *ceteris paribus* assumption) the famous LAW OF DEMAND results. This law states that when price ALONE changes for one specific good, the QUANTITY DEMANDED of that good moves in the opposite direction. The principle reason for this response is the SUBSTITUTION EFFECT, which reflects a consumer's willingness to substitute RELATIVELY cheaper goods in place of more expensive goods. For example, if the price of good X rises, consumers will switch away from X and toward a now relatively cheaper substitute. This behavioral reaction is illustrated in the graph below by the downsloping curve labeled Dx.

![Demand Curve](image)

Derived from a demand curve is the important concept of MARGINAL REVENUE (MR), defined as the change in total revenue divided by the change in quantity sold. For a typical straight line, downward sloping demand curve, MR will be a declining positive value in the elastic range of demand (MR = 0 at the midpoint). MR is negative in the inelastic range of the demand curve. Refer to Elasticity and Market Structures.

**SUPPLY** can be defined as the willingness and ability of producers to offer goods in the market. The major variables that determine supply are:
1) the market PRICE of the good;
2) the availability and prices of the resources required to produce the good;
3) production technology;
4) the market prices of ALTERNATIVE goods that could be produced with the same resources;
5) producer expectations;
6) all other factors (e.g. weather, international crises etc.) that might be significant for any specified good or service (the PORTMANTEAU variable).

If PRICE is isolated by assuming all other variables constant (the ceteris paribus assumption) the result is the famous LAW OF SUPPLY which states that as price changes in the market, suppliers will alter the QUANTITY SUPPLIED in the SAME direct[ion. The primary reason for this is the PROFIT MOTIVE; a higher market price generates increased revenue and greater profits. This is reflected in a graph with the upward sloping supply curve, Sx.

Market EQUILIBRIUM exists when, at a specific price, the QUANTITY DEMANDED just equals the QUANTITY SUPPLIED. In the graph this occurs at price P2. Any price lower than P2 (e.g. P1) will result in the Quantity Demanded being Q4 and the Quantity Supplied being Q2. This phenomenon is referred to as a SHORTAGE. If market forces are free to work (there are many buyers and sellers and government does not attempt to set price), price will rise until the shortage is eliminated and a balance (equilibrium) is restored.

Conversely, if market price is greater than P2 (e.g. P3) the QUANTITY DEMANDED (Q1) will now be less than the QUANTITY SUPPLIED (Q5), resulting in a market SURPLUS. Market forces will then act to force price downward until the surplus is eliminated and a balance (equilibrium) is restored.

If government mandates and enforces prices set below (a PRICE CEILING) or above (a PRICE FLOOR) market equilibrium, the result will be, respectively, shortages or surpluses. I would rewrite this as:
If government mandates and enforces a PRICE CEILING (a price set below the market equilibrium) or a PRICE FLOOR (a price set above the market equilibrium), the result will be, respectively, a shortage or a surplus.

If any variable that affects demand changes, OTHER than the market price of the good itself, then a SHIFT in the entire demand curve occurs. This is referred to as a CHANGE IN DEMAND. The result will be a new equilibrium in the market. Therefore, a prediction can be made regarding the changes in price and quantity. An increase in demand, a RIGHTWARD or OUTWARD SHIFT in the curve, will tend to push both P and Q higher. The reverse would be true for a decrease in demand. The curve would shift LEFTWARD or INWARD, resulting in a decline in both P and Q.

Likewise, a change in a variable other than price, which affects supply, will SHIFT the entire supply curve and is referred to as a CHANGE IN SUPPLY. A decrease in supply shifts the curve INWARD (CAUTION: DO NOT think of either curve shifting "up" or "down"; always think "inward" or "outward"). As with demand, any SHIFT in the supply curve will establish a new equilibrium. Increases in supply will tend to cause price to fall and quantity to rise. Decreases in supply will tend to cause price to rise and quantity to fall.

CAUTION: When BOTH curves are shifting at the same time (a common occurrence in the real world), note that the resulting impact on either equilibrium price or quantity can be ambiguous unless you know the relative magnitude of the two shifts. For example, suppose that technology is advancing rapidly in the production of laptop computers while at the same time consumers’ incomes are rising and their tastes and preferences are moving toward desiring more laptop computers. In this case we have both an INCREASE in SUPPLY and an INCREASE in DEMAND. These two changes put opposite pressure on market price. Unless it is known which of these shifts is proportionately greater, the final effect on price cannot be determined. It could go up or down. If both curves shift in the OPPOSITE directions, market quantity will be the potentially ambiguous variable.
**Elasticity**

ELASTICITY measures the degree of response on the part of buyers and/or sellers when any variable that affects demand or supply changes. The most common application involves an investigation of the behavior of buyers when a change in price occurs. This is referred to as the PRICE ELASTICITY of DEMAND and is defined and measured as: % change in quantity demanded / % change in price. Note that this is NOT the same as the SLOPE of the demand curve. Note also that, technically, this value (represented by $E_p$) is a negative value because demand curves always slope downward to the right; that is, $Q$ moves inversely to the price change. By convention, the negative sign is often dropped. Note: if the percent change in a variable is not given, it can be calculated with the following formula:

$\frac{(X_2 - X_1)}{.5 \times (X_1 + X_2)} \times 100$.

Elasticity values are divided into 5 ranges as follows:

1) $E_p = 0$. This is described as PERFECTLY INELASTIC, reflecting NO response at all by consumers when price changes. This results in a vertical demand curve.

2) $E_p$ is greater than 0 but less than 1.0. This is described as RELATIVELY INELASTIC, reflecting some response, but not particularly large. The important result in this range is that when price changes, consumer spending on the good (total revenue to the seller) moves in the SAME direction as price.

3) $E_p = 1.0$. This is described at UNIT or UNITARY ELASTIC. Because quantity demanded and price move in opposite directions by the same PERCENTAGE change, total spending by consumers remains UNCHANGED.

4) $E_p$ is greater than 1.0 but less than infinity. This is described as RELATIVELY ELASTIC, reflecting a substantial response to the price change. The important result in this range is that when price changes, consumer spending moves in the OPPOSITE direction of the price change.

5) $E_p = Infinity$. This is described as PERFECTLY ELASTIC. The practical result is that the demand curve would be horizontal.

The main determinants of the degree of elasticity are:

1) The number and closeness of substitute goods available (the more substitutes, the greater will be the price elasticity of demand).

2) Time. The longer the time period since the price change, the more elastic will be demand as consumers have greater ability to respond to the price change.

3) Whether the good is considered to be a luxury or a necessity. Elasticity will be lower for necessities and greater for luxuries.

Note that the elasticity concept can be applied to supply as well as demand, and ANY variable which affects buyer or seller behavior (listed previously) can be utilized.

**Consumer Choice**

The primary model of consumer choice employs Utility theory. "Utility" in this case does NOT mean usefulness. It means "Satisfaction", which is the end product of consumption. The critical component of the model is the concept of MARGINAL UTILITY, which is a measure of the amount of ADDITIONAL satisfaction that a consumer obtains from an ADDITIONAL unit of a good consumed PER GIVEN TIME PERIOD. The primary assumption in this model is THE LAW OF DIMINISHING MARGINAL UTILITY, which postulates that as the rate of consumption of a good increases, at some point, the NEXT unit consumed provides LESS ADDITIONAL satisfaction than the previous unit did.

Assume a simple choice model with only two goods, X and Y. The consumer would maximize TOTAL satisfaction when the following occurs: $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$ That is, the additional satisfaction PER DOLLAR spent on the last unit of good X must be equal to the additional satisfaction PER DOLLAR spent on the last unit of good Y. If this were not the case, a "utility-maximizing" consumer would switch from the good generating LESS utility per dollar to the one generating MORE utility per dollar.
This model can be used to substantiate the Law of Demand. Suppose that the consumer is initially consuming a combination of goods, X and Y, so as to maximize total satisfaction. Now assume the price of X increases. The result will be a reduction in the marginal utility PER DOLLAR from good X and the equation will become unbalanced. To restore a balance, the consumer SUBSTITUTES additional units of good Y in place of good X until the elements of the equation are again balanced. The result verifies the Law of Demand. When the price of X increased, the result was a decrease in QUANTITY DEMANDED.

Production and Costs
A distinction must be made between the SHORT RUN and the LONG RUN. The short run is any production period for which AT LEAST one necessary input (resource) is FIXED. The practical effect of this is that there is a finite CAPACITY that cannot be exceeded. In the LONG RUN all inputs are VARIABLE. Therefore, there is no finite capacity.

In the SHORT RUN, the fundamental underlying principle is the LAW OF DIMINISHING RETURNS (also known as the Law of Diminishing Marginal Productivity). Because of the existence of at least one or more FIXED inputs, it MUST be true that, as additional amounts of a variable input is employed; the ADDITIONAL amount of output (i.e. the MARGINAL PRODUCT) must eventually decrease. If it didn’t, there would be no fixed capacity in the short run, which is an impossibility. The graphs below illustrate two perspectives on the effect of DIMINISHING RETURNS on a firm’s costs.

The graph on the left illustrates a firm’s SHORT RUN TOTAL COSTS. Because there are FIXED and VARIABLE inputs involved in production, there are both FIXED and VARIABLE COSTS. Note that the TOTAL VARIABLE COST (TVC) curve begins at the origin, reflecting the fact that at zero output, the firm does not employ any variable inputs.

However, note that the TOTAL COST (TC) curve must include the fixed costs associated with the fixed input. Therefore, even at zero output, the firm incurs the costs associated with the fixed inputs. The VERTICAL distance between the TC and TVC curves must be equal to the amount of fixed costs, which do not change with the level of production. These two curves are VERTICALLY parallel.

The Law of Diminishing Returns causes the TC and TVC curves to eventually become steeper and steeper in slope, as costs begin to increase at an increasing rate.

The graph on the right illustrates SHORT RUN production costs on a PER UNIT basis. This version is more often utilized. The relevant curves are MARGINAL COST (MC), AVERAGE VARIABLE COST (AVC), and AVERAGE TOTAL COST (ATC).
The following “definitions” apply:

1) MC = CHANGE in total cost divided by the CHANGE in total output;
2) AVC = total variable cost divided by total output;
3) ATC = total cost divided by total output.

In this model, the Law of Diminishing Returns is reflected in the MC curve. MARGINAL COST measures the ADDITIONAL cost associated with the production of an ADDITIONAL unit of output. MC must begin to rise as a result of MP beginning to fall (diminishing returns).

AVC and ATC must eventually increase when MC becomes greater than average cost. Note that at any given output level the distance between the AVC and ATC curves must equal Average Fixed Costs (AFC).

Switching perspective to the LONG RUN, the same two graphs above can be utilized. Note that with NO FIXED INPUTS, all costs will be variable. Therefore, in the graph on the left, the only relevant curve must be the one beginning at the origin. In the graph on the right, the MC and ATC curves are the relevant ones (AVC essentially becomes ATC because there are no fixed costs).

Note that the Law of Diminishing Returns can no longer apply (since there are no fixed inputs). ECONOMIES and DISECONOMIES OF SCALE now explain the shapes of the cost curves. Economies of Scale are defined as cost advantages that result when firms get larger and larger. Bulk buying of inputs would be an example. The result is the downward sloping portion of the ATC curve. Diseconomies of Scale are defined as cost disadvantages that result from increasing firm size. Managerial inefficiencies and increased costs associated with MONITORING employees would be possible reasons for diseconomies of scale. The result is the upward sloping portion of the ATC curve.

**Market Structures**
The following are the four principle MARKET STRUCTURES of Capitalism:

1) PERFECT COMPETITION;
2) MONOPOLISTIC COMPETITION;
3) OLIGOPOLY;
4) MONOPOLY.

PERFECT COMPETITION requires the following characteristics:

1) Many firms and many buyers to the extent that neither producers nor consumers have the power to set price;
2) No BARRIERS TO ENTRY (factors that would make it difficult to impossible for new firms to enter the market);
3) PRODUCT HOMOGENEITY—each firm’s output is indistinguishable from that of any of the other firms in the industry;
4) VIRTUALLY costless information available to both buyers and sellers.

The general outcome in this model is for firms to produce EFFICIENTLY and earn only NORMAL profits. Normal profit is defined as the minimal return to the firm’s owners which is just sufficient to keep them in the market. In the SHORT RUN, any profits which exceed this amount (referred to as ECONOMIC PROFITS) will induce new firms to enter the industry in the long run. This will increase market supply and compete prices back down to a level just sufficient to generate a NORMAL rate of return.

MONOPOLISTIC COMPETITION is characterized by many firms and many buyers but differs primarily from Perfect Competition in that the product is DIFFERENTIATED from one firm to another. This market structure also tends to generate only NORMAL profit in the long run. Production is generally less efficient than in Perfect Competition. However, consumers do get more choices.
OLIGOPOLY consists of a FEW firms dominating an industry. Because firms are relatively large and few in number, the primary defining characteristic of Oligopoly is MUTUAL INTERDEPENDENCE. This means that a firm must consider the reactions of its competitors when making decisions. Barriers to Entry are often substantial and can make it difficult to impossible for new firms to enter the industry. If this occurs, then the CARTEL model of Oligopoly may apply. By controlling industry output Cartels can control price. If Barriers to Entry are not insurmountable, the POTENTIAL for other firms to enter and compete can lead to a more competitive outcome. ECONOMIC PROFITS are possible in both the short and long run. GAME THEORY models are used by economists to investigate the behavior of Oligopolies.

In MONOPOLY there is only one firm in the market. This leads to MARKET POWER—the ability to set price by controlling output. Monopolistic markets, compared to more competitive markets, tend to result in lower output and higher prices. For this reason, Monopolies are generally considered to harm consumers. In the U.S., Monopolies can be prosecuted under the Sherman and Clayton Antitrust Acts. An exception to the general harmful effects of monopoly is the possible existence of NATURAL MONOPOLIES. A Natural Monopoly is said to occur when a single producer can produce the entire output desired at a lower cost than could two or more competing firms. Examples could be a water company or a natural gas company which supplies a local community.

Firms, regardless of market structure, maximize profits at the production rate where MC = MR.

Resource Markets
Resource markets are special cases of the basic supply/demand model covered previously. The difference is that now we're investigating the buying and selling of INPUTS (Resources) rather than OUTPUTS. Consequently, firms become the buyers and individuals become the sellers. The previous analysis concerning equilibrium, shortages, and surpluses applies. However, several new concepts arise.

An important concept is MARGINAL REVENUE PRODUCT (MRP). MRP is defined as the ADDITIONAL revenue generated by the employment of an ADDITIONAL unit of any resource. A worker's MRP is essentially how much that additional worker is WORTH to the firm. Therefore, it is MRP that determines a firm's demand for a resource. Resource prices, like product prices, are determined by supply and demand.

MARGINAL FACTOR COST (MFC), or MARGINAL RESOURCE COST (MRC), measures the ADDITIONAL cost associated with the acquisition of an ADDITIONAL unit of an input. The profit maximizing rule for employing resources is MFC = MRP.

A MINIMUM WAGE is a PRICE FLOOR in a labor market, which will result in a surplus of labor (unemployment). The elasticities of labor supply and demand will determine the magnitude of this unemployment effect.

A MONOPSONY occurs when a single BUYER dominates market.

Market Failure and the Role of Government
A critical point to remember is that MARKET FAILURE does NOT mean that a firm loses money or goes out of business. It means that the market SYSTEM does not lead to outcomes that society prefers with respect to prices, quantities of output, resource allocation and/or societal welfare.

If these “failures” are considered to be significant enough, GOVERNMENT actions can be brought into play to modify these outcomes.
The following may result in Market Failure:

1) EXTERNALITIES: Externalities are COSTS or BENEFITS that are not incorporated into market supply or demand curves. Pollution is an example of a COST (negative) externality. Education is an example of an output that is widely considered to have BENEFIT (positive) externalities associated with it. The existence of externalities leads to a misallocation of society’s scarce resources. Government actions (e.g. taxes, subsidies, regulations, direct production) potentially can result in more preferred outcomes.

2) PUBLIC GOODS: Public Goods have two essential characteristics. They are COLLECTIVELY CONSUMED and, once provided, even someone who does not pay anything for them can NOT be excluded from consuming them (e.g. a nation’s military establishment or a lighthouse). This results in the classic FREE RIDER effect. The practical result is that no profit-seeking private firms will produce these goods because they would not be able to cover their production costs. Government must play a role in the provision of these goods if they are to be produced in the quantities desired.

3) MARKET POWER: Market power is the ability to control market price and results when Monopolies exist. Output is restricted and prices are higher than they would be if a competitive market existed. Antitrust laws can be used by government to break up monopolies. Natural monopolies can be regulated.

4) LACK of INFORMATION: Rational choices can only be made when producers and consumers have appropriate information. For example, lack of knowledge about the actual effects of second-hand smoke or accurate information as to whether or not your food is contaminated with e-coli can lead to “bad” choices in the market. Government can play a proactive role in generating and/or disseminating relevant information.

Note that GOVERNMENT FAILURE may also occur. This happens when government intervention leads to a less-preferred outcome than would have prevailed without it.

Measurement of Economic Performance
The following statistics are the most widely used:

1) GROSS DOMESTIC PRODUCT (nominal GDP) is defined as the total market value of all final goods and services produced in an economy, generally measured on an annual basis at current prices. Whenever a good is produced, somebody receives income for producing it. This is why AGGREGATE INCOME (a.k.a NATIONAL INCOME) equals AGGREGATE PRODUCTION (a.k.a. GDP). National Income = compensation of employees + rent + interest + profit. GDP = consumption + investment + government purchases + (exports - imports). Note: Exports minus Imports is commonly abbreviated as F.

2) REAL GDP is nominal GDP adjusted for inflation. This is appropriate for measuring an economy’s REAL ECONOMIC GROWTH. To obtain real GDP from nominal GDP, use the following formula:

\[
\text{Real GDP} = \left( \frac{\text{Nominal GDP}}{\text{Price Index}} \right) \times 100
\]

3) The GDP deflator is a PRICE INDEX that measures the change in prices of all final goods and services that make up an economy’s GDP. It is the broadest measure of inflation.

4) The CONSUMER PRICE INDEX (CPI) is a measure of the average change in prices of the final goods and services purchased by households and individuals. Some individuals’ incomes are INDEXED to the CPI (e.g. the pensions of military retirees).

5) The PRODUCER PRICE INDEX (PPI) is a measure of the average change in the prices received by domestic producers. Because this index includes many intermediate goods and commodities, it is widely considered to be a LEADING INDICATOR of future changes in the CPI.
6) The **CORE RATE** of INFLATION refers to an inflation statistic from which ENERGY and FOOD prices have been removed. This is considered to be a better measure of underlying long-term inflation in the economy.

7) The **OFFICIAL UNEMPLOYMENT RATE** is the most widely reported statistic measuring unemployment. It measures the percentage of the LABOR FORCE which is currently out of work but actively seeking work. The labor force is the sum of the employed plus the unemployed. Many economists believe this statistic UNDERSTATES actual unemployment as it does not count involuntary PART-TIME workers (part-time workers who want full-time jobs) or DISCOURAGED workers who have given up actively seeking jobs.

The economy is subjected to constant upturns and downturns in economic activity. This is known as the **BUSINESS CYCLE**, and it has the following phases: peak, downturn (contraction), trough, upturn (expansion).

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**Aggregate Demand and Aggregate Supply**

The **AGGREGATE DEMAND/AGGREGATE SUPPLY** model is the fundamental analytical model in **MACROECONOMICS**. A very basic version, highlighting a recessionary gap, is illustrated below.
Note that the average prices of ALL goods and services (PRICE LEVEL) are measured along the vertical axis and the output of ALL goods and services (REAL GDP) is measured along the horizontal axis.

AGGREGATE DEMAND (AD) consists of the spending on final goods and services by the four SECTORS that make up the economy: CONSUMPTION (households and individuals), INVESTMENT (businesses), GOVERNMENT (state, local, and federal), and the NET FOREIGN sector. Therefore \( AD = C + I + G + F \). The net foreign sector \( F \) is defined as Exports – Imports.

SHORT-RUN AGGREGATE SUPPLY (SRAS) illustrates how businesses will adjust their output and selling prices in the short run when a change in spending occurs.

LONG-RUN AGGREGATE SUPPLY (LAS), or POTENTIAL OUTPUT, is determined by an economy's resources and technology, NOT the price level. Therefore, it is a vertical curve. It reflects an economy's PPF (previously covered).

SHORT-RUN EQUILIBRIUM occurs where the AD curve intersects the SRAS curve, point A in the graph. This determines a particular combination of PRICE LEVEL and REAL GDP. In the case illustrated, equilibrium occurs at Price Level \( P - 1 \) and output level \( Y - 1 \).

Note that at \( Y - 1 \), this economy's actual real GDP falls short of its LAS (POTENTIAL OUTPUT). This situation is referred to as a RECESSIONARY GAP. If short-run equilibrium real GDP falls to the right of LAS, the situation is referred to as an INFLATIONARY GAP.

In the LONG-RUN, either the AD or the SRAS curve must shift (or some combination thereof) so as to bring about an intersection of all three curves (LONG RUN EQUILIBRIUM).

**Money and the Banking System**

MONEY is the critical "lubricant" for the economic system. Too little money slows the economy down, potentially resulting in a RECESSION. Too much money speeds up the economy beyond its sustainable rate of production, generating INFLATION.

MONEY is anything that effectively serves as a MEDIUM of EXCHANGE, a UNIT of ACCOUNT, and a STORE of VALUE. Currency and account balances in financial institutions make up our present-day money supply. Note that GOLD is NOT money, nor does it "back" any of our money. The only thing backing the money supply is the faith and confidence we have that someone will exchange something of value for our money. Note also that CREDIT CARDS are NOT money.

The U.S. MONEY SUPPLY is controlled by the FEDERAL RESERVE (FED), the central bank of the U.S. The power centers in the FED are the BOARD of GOVERNORS (BOG) and the FEDERAL OPEN MARKET COMMITTEE (FOMC).

The BOG consists of seven members appointed by the President and confirmed by the Senate to serve 14-year terms. One of these seven individuals, of disproportional significance, is the Chairman of the FED, who serves a 4-year term and can be reappointed.

The FOMC is the most important POLICYMAKING body and consists of 12 voting members, the seven FED governors plus five of the twelve presidents of the FEDERAL RESERVE DISTRICT BANKS.

The primary mechanism used by the FED to manage the supply of money and credit is OPEN MARKET OPERATIONS (OMO), the buying and selling of U.S. TREASURY SECURITIES. Purchasing treasury securities creates RESERVES for the banking system, selling securities destroys RESERVES. RESERVES form the basis for banks to make loans to borrowers, the process that results in the creation of money circulating in the economy.
The FED also performs the critical function of being a "lender of last resort," the ultimate provider of liquidity for the economy. When the FED makes loans (usually to banks, but recently also to large financial firms) the interest rate charged is referred to as the DISCOUNT RATE.

**Monetary Policy and Fiscal Policy**

MONETARY POLICY is the FED's manipulation of the supply of money in order to influence the level of Aggregate Demand (previously covered) in the economy. In recent years, FED policy has been oriented around "targeting" the FEDERAL FUNDS RATE, the interest rate banks charge other banks when RESERVES are loaned by banks with EXCESS RESERVES to those having a reserve deficiency. By utilizing OMO, the FED controls the supply of RESERVES in the banking system and, therefore, the "price" of those reserves—the FEDERAL FUNDS RATE.

To combat a RECESSIONARY GAP, the FED may implement EXPANSIONARY MONETARY POLICY by lowering the FEDERAL FUNDS RATE. This would encourage borrowing and spending, pushing the AD curve outward. Conversely, the FED would push this rate upward to combat an INFLATIONARY GAP, thereby pushing the AD curve inward.

FISCAL POLICY involves attempts by CONGRESS and the PRESIDENT to adjust the level of AD by adjusting the levels of federal spending and taxes. To combat a RECESSIONARY GAP, spending would be increased and/or taxes lowered, shifting the AD curve outward. The opposite actions would be implemented to combat an INFLATIONARY GAP, thus shifting the AD curve inward.

When the Fed enacts expansionary or contractionary monetary policy, the money multiplier will affect the outcome of how much money is available in the economy. The SIMPLE MONEY MULTIPLIER is \(1/r\), where \(r\) is the required reserve ratio. The required reserve ratio is the ratio of reserves a bank must keep for every deposit made. For example, if \(r = 20\%\), then the bank must keep 20\% of all deposits as reserves. This leads to a simple money multiplier of \(1/0.20 = 5\). The money multiplier tells you the amount of money ultimately created per dollar deposited in the banking system. If $100 is deposited, $500 will exist in the system (because 5 x $100).

Note that the FEDERAL government is not mandated to run a balanced budget. If federal spending exceeds federal revenues a BUDGET DEFICIT occurs. The reverse situation results in a BUDGET SURPLUS. Deficits increase the level of the NATIONAL DEBT, money owed by the federal government to anyone who owns the U.S. Treasury securities which were sold to finance the debt. Note that it is NOT necessary, nor will it happen, for the federal government to PAY OFF the National Debt. It is necessary, however, to make INTEREST payments on that debt.

**Economic Growth**

ECONOMIC GROWTH is an increase in REAL GDP. Some factors that encourage economic growth are: (1) A greater quantity of productive resources; (2) A greater quality of productive resources. Note: the "qualitative" aspects associated with labor (e.g. skills, education, health) are referred to as HUMAN CAPITAL; (3) Technological Advancements; and (4) Appropriate Institutions (e.g. efficient banking and legal systems, attitudes that encourage saving, investment and innovation, a stable political system).

At a 3% annual growth rate, GDP will double in 24 years. At a 4% inflation rate, the value of money will be cut in half in 18 years (use the RULE of 72).

**International Trade and Policy**

Economists are generally advocates of free trade because of the GAINS FROM TRADE possible when countries produce and export those items for which they have a COMPARATIVE ADVANTAGE. The international sector involves not only the importing and exporting of produced goods and services but also all financial transactions among countries.
The primary international organization for promoting international trade is the WORLD TRADE ORGANIZATION (WTO). An important trade agreement concerning the U.S. is the NORTH AMERICAN FREE TRADE AGREEMENT (NAFTA).

International trade agreements are generally aimed at reducing barriers to trade. Some of the more important trade barriers that nations impose are:
1) EMBARGOES: a legal sanction against trading with another country (e.g. current U.S. policy toward Cuba)
2) TARIFFS: taxes levied on goods coming into a country in an attempt to make the imported goods less competitive with domestically produced goods.
3) SUBSIDIES: government payments to domestic producers which make competition from foreign producers more difficult (e.g. Britain and France subsidizing Airbus)

Exchange Rates
FOREIGN EXCHANGE RATES are the prices of any country’s money in terms of the monetary units of other countries. These are determined by supply and demand in the FOREIGN EXCHANGE MARKET (the buying and selling of currencies). Increases in a country’s IMPORTS cause an increase in the supply of its money in the market; increases in EXPORTS cause an increase in demand for that country’s money. A DEPRECIATION in a country’s currency will induce an increase in its exports and a decline in its imports. An APPRECIATION in a country’s currency will cause the opposite market reactions.

Central Banks sometimes attempt to intervene in foreign exchange markets by manipulating the supply and/or demand for various currencies.

BALANCE of PAYMENTS and BALANCE of TRADE
A nation’s BALANCE of PAYMENTS (BOP) is an accounting of all international economic transactions involving goods, services and all financial transactions.

A nation’s BALANCE of TRADE (BOT) includes only economic transactions involving goods and services. A BALANCE OF TRADE DEFICIT occurs when the value of a nation’s imports exceeds the value of its exports.

Some key factors that can affect a nation's BOT are changes in exchange rates, inflation rates, economic growth rates, and central bank policies.

References
ECO 201 – Principles of Macroeconomics:
Latest edition of any standard Macroeconomic Principles text.

Recommended:

ECO 202 – Principles of Microeconomics:
Current edition of any standard Microeconomic Principles text.

Highly recommended: