ECON-102: Principals of Microeconomics

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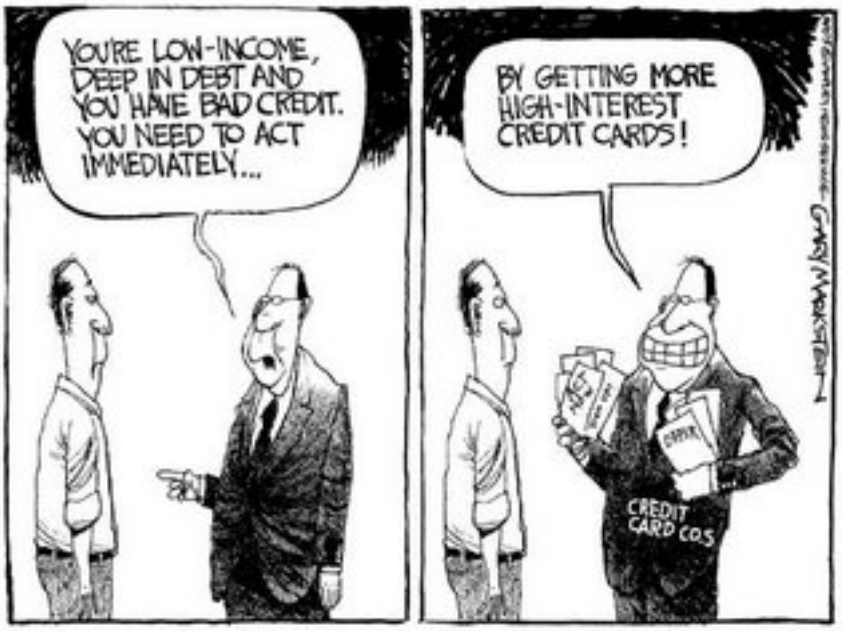

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1 Unit 1: Fundamental Concepts

1.1 Section 1: Economics

In general terms, economics is defined as the study of how we can best increase a nation's standard of living and citizens' happiness with the resources that we have available to us.

Standards of living include:

- cars
- houses
- leisure time
- access to health care
- cleaner air

1.1.1 Marginal Benefit & Marginal Cost

Marginal benefit and marginal cost can be though of as a positive cause-and-effect in a business environment, with the benefit being the effect and cost being the cause. When your marginal benefit is greater the marginal cost, the more likely a positive investment is at play. For example, you may buy an expensive car for your long commute, but it has the best MPG in the current car market and is heavily reliable (marginal benefit)–potentially outweighing the initial cost (marginal cost).

1.1.2 Difference between Macro- & Micro- economics

Macroeconomics focuses on the wider concepts that play a role on the entire economy. Components of this include:

- national unemployment rate
- inflation rate
- interest rate
- federal government budgets & fiscal policies
- economic growth
- Federal Reserve System & monetary policy

- foreign exchange rates
- balance of payments

Microeconomics deals with the smaller concepts of an economy such as:

- supply and demand of individual goods and services
- price elasticity (sensitivity) of goods and services in demand
- production
- cost functions
- business behavior and profit maximization
- income inequality & distribution
- effects of protectionism (tariffs, quotas, trade restrictions, etc.)

If macroeconomics is studying a forest, microeconomics is studying the individual trees.

1.2 Section 2: The Production Possibilities Curve

1.2.1 Production Choices

Production choices are the idea that if you have limited resources to produces various products, you want to optimize the resources at hand so that you can make the most of the available resources, not under-use, and not over-promise a production value that is not achievable.

1.2.2 Points on the Curve and Trade-Offs

In a given graph, any values that lie on the curve means that the operating cost of the products are being used as efficiently as possible. The idea is that the output cannot increase if it is limited by a constant resource and technology. Scarcity talks about the limited resources at hand–which directly correlates with the Production Possibility Curve. If a value lands on the curve, increasing the production of one good/category will be at the expense of other goods/categories. Points E, C, B, A, and D depicted in figure 1 represents the most optimized products that can be produced with resources at hand. It also shows varying priorities for both Guns and Roses productions.

Any points that fall inside the curve (to the left of the curve, i.e point G in figure 1) shows an inefficient use of resources to produce products. Some

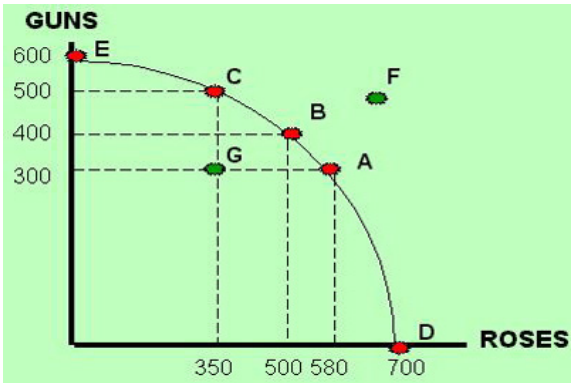

Figure 1: Example of a Possibility Curve of Guns and Roses production.

reasons for this could be using fewer than the available resources (unemployment), or using all resources but inefficiently (underemployment).

Points that fall outside the curve (to the right of the curve, i.e point G in figure 1) shows a combination that cannot be achieved with the available resources. This value does not mean point F will never be achievable– the economy may grow and F may fall on or inside the Possibility curve, but at the current analysis of the economy, it will not be possible. Increases in technology and/or resources can help contribute to the growth of the Production Probability Curve, which can help reach point F in the future.

1.3 Section 3: Economic Growth

Economic growth occurs when the economy realizes greater production levels. Essentially, when either the number of resources increase, or the way we use resources becomes more efficient, is the only time the curve can shift outwards. In short, economic growth is made possible by advances in technology and/or increase in resources.

1.3.1 Increase in Capital Goods

If a country is producing at full employment, more capital goods can be produced only inf the country produces fewer consumption goods. A few ways governments can encourage more production of capital goods can be through tax breaks for the production of capital goods, or increasing taxes on the production/sale of non-capital (consumption) goods.

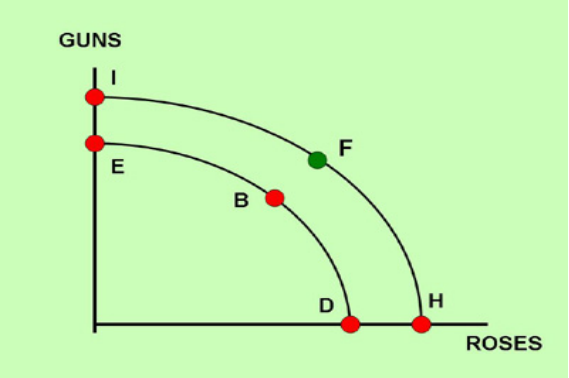

Figure 2: Example of how economic growth now reaches point F.

1.3.2 Advances in Technology

Advancements in technology that contribute to economic growth are usually due to entrepreneurs who have incentives to produce more efficiently and lower their costs. When this model is successful, this usually drives the entrepreneur to continue to improve their models to become more efficient with both the work/effort needed, and the money saved. Governments that allow entrepreneurs to keep most of their profits and tax them less has been shown to produce greater rates of technological growth. In addition to new technology, the more human technological advancements made (greater education, training, skills, etc), the higher the production probability curve also grows.

1.3.3 Economic Growth and Economic Systems

There are various factors that can lead a country to economic growth and downfalls. For example, in a capitalist country, having a government that supports just reward systems (taxes and regulations that reward work and entrepreneurship), just legal system, infrastructure, national security, and protection of individual property rights can all lead to great economic growth. Also, political incentives can also lead to economic growth. For example, India's switch to international trade in the 90's has led to greater opportunities, and the same for China in the 80's when they adopted the free market elements.

Countries that practice communistic or command economy policies have seen significantly less economic growth due to the sheer control the government has over resources and entrepreneurial entrepreneurial incentives.

In third world countries, instability with governments, corruption, civil strife, national security, and uncertainty make is extremely difficult to have

a steady, growing economy.

1.3.4 Conditions for Economic Growth

Countries with the highest per-capita earnings are characterized by all or most of the following:

1. **Strong private property rights.**

   If a country does not do its best to protect the property rights of its citizens, then the incentive to work hard in an economic state begins to dwindle. If a country allows the protection of private property to individuals, then incentive to work hard increases, since the properties (land, equipment, commodities, etc) is protected and belongs to the individual who earned it.

2. **Free markets, free international trade, and a stable price level.**

   Free markets are markets in which prices of goods and services, wages, rents, interest rates, and foreign exchange rates are determined by the interaction of private sector demand and supply.

   In order for free international trade, countries need to avoid protectionism (tariffs, quotas, etc.)

   Stable price level is achieved when there is little to no fluctuation in the country's average price level. This can be achieved by a country's monetary agency keeping its money supply restricted or constant.

3. **Essential government regulations and reasonable levels of taxation.**

   Balanced rule, regulations, and taxes must be enforced by governments in order for governments to provide essential functions. If there is too high of a tax, businesses and individuals will be less incentivized to work, while excessive regulations can lead to time consuming and expensive business operations. If there are high taxes and excessive regulations, this discourages business start-ups, make businesses fail, or businesses may move abroad to avoid high taxes/regulations.

4. **Little corruption.**

   If a governments/private groups initiates force by taking away citizen's businesses'/private property, it does not give any incentive for individuals to create/continue/maintain business with that government.

The only cause of long-term economic growth and outward shifts in the production possibility curve are *increases in resources and advances in technology*. More and better resources allow businesses to produce more efficiently and effectively, lower costs, increase real incomes and increase purchasing consumers' power. Increasing a nation's money supply or increased government spending *may* help in the short-run, but has economic disadvantages in the long-run. When wages are increased, that only means that the price of goods and services will increase. There is no profit gain for businesses, and there is no money-saved from consumers. The only thing that has changed is the *nominal* prices of wages, goods and services. The only way to increase real profits is to increase productivity. This also lowers costs and decreases prices, which allows increases in real profits and real demand.

1.4 The Circular Flow

The way how a basic economy works is that businesses offer goods, and households pay businesses for those goods. Households also offer services to the businesses, and in return, businesses pays the households for their services. Government also plays a role, since they offer neutral services to both parties (households and businesses). Since they offer services to both parties, the parties must also contribute to the government for those services (in the form of taxes).

When you bring in foreign markets into account, the same principals apply for businesses, households, and governments.

Figure 3 is an illustration of the circular flow of a basic economy.

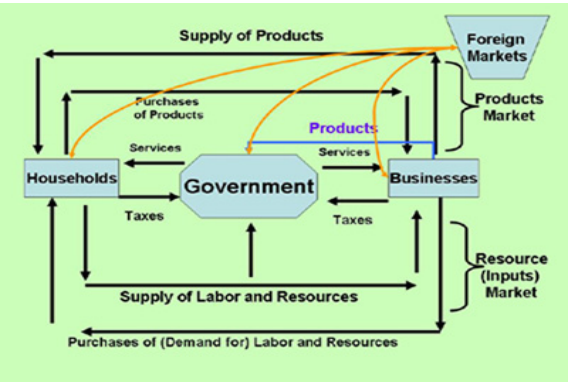

Figure 3: Graphical representation of how the circular flow works with businesses, households, governments, and foreign markets.

1.5 Economic Systems

There are three different types of economic systems:

- **Laissez-faire economy** represents a pure capitalist system (also called a price system). In this economy, the supply and demand behavior of businesses and households determine the price of goods and services and factors of production. The government plays a very limited role and only provides the most essential functions such as a legal system, protecting individuals/property rights, and providing infrastructure and certain public goods.
- **Command economy** is a communist system where a country's government determines the prices of goods and services and factors of production. The country/government controls all of the country's economic decisions.
- **Mixed economy** is a mix between a command and laissez-faire economy. The exact mix of the two is dependent on the government involvement. Most industrialized countries follow this type of economic system.

1.6 Important Concepts and Definitions

Some definitions and concepts that will be used throughout these notes.

1.6.1 Nominal and Real Values

Nominal value (nominal wages, nominal interest rates, nominal Gross Domestic Product, GDP) is the price of the actual dollar value which was recorded during the transaction. This can be the price that shows up on a contract, receipt, etc. You can think of this as the original monetary price of an invoice. Real value is the monetary value that is reflective of the current market. For example, lets say you bought a house 10 years ago for $50,000, but its current market value is $100,000. The nominal value of the house is $50,000, while the actual value is $100,000.

1.6.2 Positive and Normative Economic Statements

Positive economic statements are facts, or statements which can be proven. Positive statements does not have to be a true statement; the statement can be proven false. It just needs to be provable. Examples of positive economic statements are:

- The federal government experienced a budget surplus this past year (this is a false positive statement, but, by definition, a positive economic statement).
- When the value of the dollar falls, Japanese products imported into the United States become more expensive (this is a true positive statement).
- Legalizing drugs will reduce the drug profits that illegal drug dealers make (this is a true positive statement).
- The United States does not have a federally mandated minimum wage (this is a false positive statement).

A normative economic statement cannot be proven; they are opinions or value judgements. Examples of normative economic statements are:

- The government should raise taxes and lower government spending to reduce the budget deficit.
- We need to try to lower the value of the dollar in order to discourage the imports of Japanese goods into this country.
- Our government should legalize the use of drugs in this country.
- The federal minimum wage should be at least $15.00.

1.6.3 Ceteris Paribus

Latin for "if no other things in the economy change". When college tuition rises, student enrollment will decrease, ceteris paribus. But if the parents' real income increased as well, then student enrollment may increase, despite the tuition increase. Therefore, the ceteris paribus condition is violated.

1.6.4 Fallacy of Composition

If you say what is good for one thing is *necessarily* good for the entire group, then you are subject to fallacy of composition. If a college has a shortage of parking spots, your intuition is to tell students to arrive early. But if every student comes early, there will still be a parking shortage issue.

1.6.5 Broken Window Fallacy

The idea that destruction stimulates the economy, therefore destruction creates employment. This is not true. If you break a window, and hire a glazier to fix it at the cost of $500, the you have provided employment to the glazier. However, if you did not break the window, you would have kept the $500, and afterwards you could buy a watch (which also increases employment). If you break the window, you are gaining the employment of the glazier, but losing the employment of the tailor. If you don't break the window, you will 1) keep the window, 2) keep the $500. 3) employ the tailor. Keeping the window is an important factor, since it was already working, therefore there was no need to mindlessly destroy it in order to hire a glazier. In general, destruction is not a good thing microeconomicailly.

1.6.6 Fallacy of Cause and Effect

Basic idea of cause and effect; just because one action is immediately followed by another action, does not mean action a caused action b to occur.

1.7 Economics and Critical Thinking

When looking at economic statements, scenarios, and analyses, you have to pay attention and think about these six guidelines:

1. **Question the source.**
   Study the background of the person making the statement to determine biases.
2. **Question the assumptions.**
   Make sure you are not drawing conclusions too fast before thinking of other factors that might come into play.
3. **Question how the variables are defined.**
   The defining of variables is extremely important. If you are vague with the variables in your assumption, then you will have poor results, or the results you did not intend on happening. You can also be fooled by others' poor variable definitions, potentially swaying you and causing a sort of false-results. Garbage-in, garbage-out.
4. **Question the validity of the statement.**
   Make sure the statements concluded do not fall into the fallacies, like the fallacy of cause and effect, and fallacy of composition (broken window fallacy).
5. **Question the statistics.**

Statistics can be meddled with, especially when you are vague with defining variables in your initial question.

6. **Think like an economist.**
   Think practical in the sense of the real world and economics. Yes, maybe one solution passes the above five checks, but is it reasonable in the real world (outside of the math and conditions)?

2 Unit 2: Supply and Demand

2.1 The Law of Demand

The law of demand states that buyers of a good will purchase more of the good if its price is lower, and vice versa. This assumes that no other economic changes take place. This law assumes ceteris paribus–no other changes take place.

2.1.1 Substitution and Income Effects

The substitution effect states that as the price of a product decreases, it becomes cheaper than competing products (assuming the competing product does not decrease in price). Consumers will substitute the cheaper product for the more expensive product.

The income effect states that as the price of a product decreases, buyers will have more income available to purchase more products, and vice versa. The buyer will more likely buy more of the product that became cheaper, since they have more expense to use on said product.

2.2 The Demand Curve

When graphing a demand curve, we look at two variables, product (P) and the quantity (Q) of the product purchased during a certain time period. The demand curve always slopes downwards. Figure 4 the demand curve.

Market demand is the total demand for a product by all customers. Total demand is the sum of all *individual* buyers' demand.

A demand schedule and a corresponding demand curve represents the buyer's *willingness* and *ability* to purchase the product. For demand to exist, a buyer must *desire* and be *able* to afford it.

Usually, a buyer's willingness to purchase a product depends on the value the buyer expects to receive from purchasing the product. This is called the **utility**.

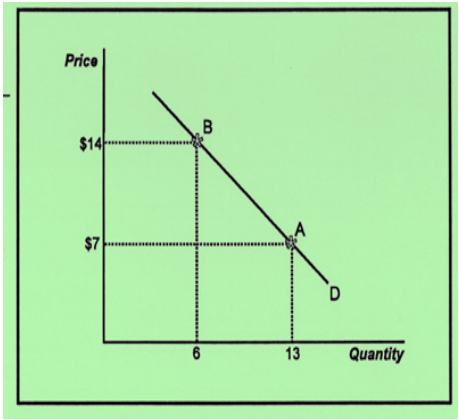

Figure 4: Graph of demand curve.

When a buyer purchases additional products, this is called the **marginal utility**. Typically, a buyer's marginal utility decreases as the person consumes more of a product.

util is the imaginary measure of satisfaction. Since satisfaction differs for different people and products, there is no real measurement. It is used for comparison purposes. Utils is the measurement of utility.

Usually, more valuable items come with more utility (lets say, a car). If you do not own a car, the first car you get will have high utility. But if you wanted to buy a second car, the second car does not have nearly as high of a utility as the first car did. This is called the **law of diminishing marginal utility**.

In other words, the more of a product you have, the less satisfaction you receive from buying additional products. This does not apply for every product. Beer, for example, usually does not follow this law (since the more you drink, the more you will typically want).

2.3 The Law of Supply

2.3.1 Price and Quantity Changes

When ceteris paribus, product suppliers offer more of a product at a higher than at lower prices. If a product price is high, then the supplier can make a greater profit by selling more (assuming the price of production is constant and there is a demand for the good).

2.3.2 Income and Substitution Effects

Income effect is when a business is able to sell a product for a higher price and still sell approximately the same amount.

The substitute effect is when a supplier notices the market price of product A increasing, ceteris paribus, producing product B will be less attractive to the supplier. The supplier will want to produce more of product A since they can make a better profit out of it compared to producing product B.

2.4 The Supply Curve

The supply curves has an upwards slope. At higher prices, firms are willing and able to sell more than at lower prices. There is a direct relationship between price and quantity supplied. Figure 5 shows the supply curve.

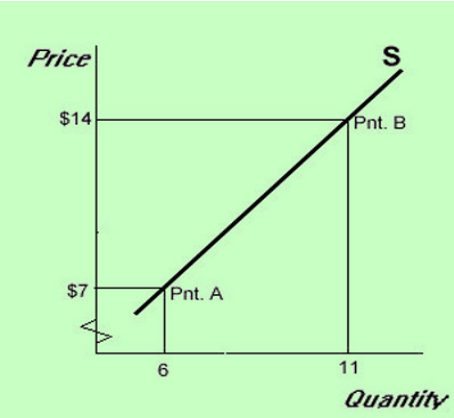

Figure 5: Graph of supply curve.

The same principals of the demand curve applies to the supply curve.

2.5 Equilibrium Price and Quantity

2.5.1 Market Price and Quantity

When you put the supply and demand curve together, you will obtain a graph with an intersecting point. This intersecting point is the equilibrium of what suppliers want to price their product quantities at, and what buyers are willing to buy quantity at certain prices. If a seller wants to sell their product for an extremely high price, buyers will only buy small quantities when sellers actually want to sell a lot more. To compromise, they will lower

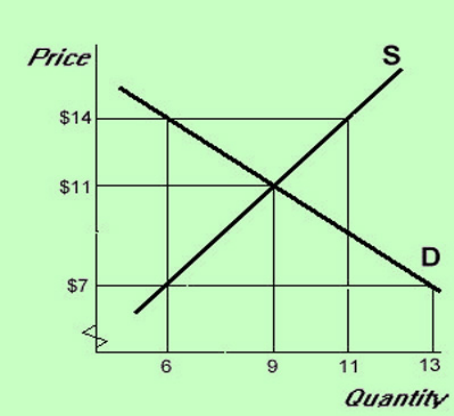

Figure 6: Graph of how supply and demand curves combined will create an equilibrium.

the price. Vice versa with buyers. Figure 6 an example of the equilibrium graph.

An example of lower-limits (price floor) to the supply-demand equilibrium is rent control. Rent control is placed below the equilibrium, so that more people can afford housing, but doing so, landlords are less incentivized to create those living spaces since they will not be making profits.

An example of upper-limits (price ceiling) is minimum wage. Minimum wage is set above the equilibrium. This means that there is more incentive for workers to want to get a job (because they will be paid more), but companies will not want to pay this since they will lose profits. There will be less demand for companies to hire vs the high supply of willing workers.

2.6 Demand Determinants

Demand curve can shift from left to right, and they are determined by these factors;

1. **A change in buyers' real income or wealth.**

   Usually, a normal product increases if the buyers experiences an increase in real incomes or wealth. However, when this happens, some products may experience a decrease in demand. For example, someone who could only afford pasta can now afford steak. Steak will become the normal product as the buyer will no longer purchase pasta as much as steak since they experienced the increase of real income/wealth.

2. **Buyers' tastes and preferences.**

Self explanatory, the more popular an item is, the more buyers will want it. Also, this will leave unpopular items to be sold less, therefore lose value.

3. **The prices of related products or services.**

   A buyer always purchases product A. All of a sudden, product B is cheaper than product A. The buyer will instead start to purchase product B since it is cheaper, lowering the demand for product A, and increasing the demand for product B.

4. **Buyers' expectations of the product's future price or availability, or their future income or wealth.**

   If buyers assume increased incomes, or product value (they believe there will be a shortage of toilet paper, more expensive gas prices, etc.), the demand will rise in the short-term (stock up on toilet paper, fill up the gas tanks). This will also increase the costs of those items since the demand also rises (in the short-term).

5. **The number of buyers (population).**

   The more of a population, the more the demand will be. If there is a rise of newborn babies, there will be higher demand for baby products.

2.7 Change in Demand on Equilibrium Price and Quantity

When the demand curve shifts to the right, demands increases. The market price increases, and so does the equilibrium quantity (in the short-run).

When the demand curve shifts to the left, equilibrium price and quantity decreases (in the short-run).

2.8 Supply Determinants

Supply curve can shift from left to right, and they are determined by these factors:

1. **Advance in technology.**

   Advancements in technology will lower the cost of producing it, which increases profit. Also creates incentive to increase supply.

2. **Change in the price of an input used to make the product.**

   When price of input (labor, raw materials, machinery, land) decreases, business makes more profit per product and is willing and able to increase the supply of the product (and vice versa).

3. **Change in taxes, subsidies, or regulations.**

   Taxing or more regulations on manufacturing of a product lowers the supply, because cost of producing supply increases. A subsidy (government grant) to a business or individual can increase the supply.

4. **Number of suppliers.**

   When there are more competitors of a product, there will be more demand (and vice versa). Sometimes, government agencies can limit the amount of suppliers (licenses, permits, diplomas, etc) which safeguards the consumers to ensure they receive quality, but also limits the amount of suppliers.

2.9 Change in Supply on Equilibrium Price and Quantity

An increase in supply will show the line going rightward (or downward), while a decrease in supply will show the line going leftward (or upward).

Figure 7 shows an example of what this looks like.

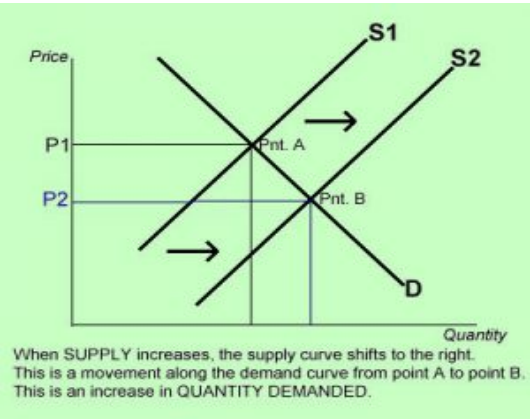

Figure 7: Plot of supply shift.

2.10 The Effect of Change in Both Demand and Supply on Equilibrium Price and Quantity

When talking about short and long term changes, short term is in a time span of several months, while long term is over a year or longer. *Equilibrium price* represents the market price (price you find at the grocery store). When talking about the *equilibrium* quantity, it represents the quantity or amount of a certain product being bought and sold in a store.

A simple way to know when supply and demand affect price and quantity increases/decreases is by memorizing the four conditions:

When **demand** *increases* $\Longrightarrow$ **Price** *increases* and **quantity** *increases*

When **demand** *decreases* $\Longrightarrow$ **Price** *decreases* and **quantity** *decreases*

When **supply** *increases* $\Longrightarrow$ **Price** *decreases* and **quantity** *increases*

When **supply** *decreases* $\Longrightarrow$ **Price** *increases* and **quantity** *decreases*

2.11 Demand vs Quantity Demanded and Supply vs Quantity Supplied

2.11.1 The Difference between Demand and Quantity Demand

If the market price of a product decreases, then the *quantity demand* increases, and vice versa. For example, when the price of strawberries decreases (while in season), more customers will purchase strawberries. Figure 8 how the quantity demand has changed by a movement *along* the demand curve.

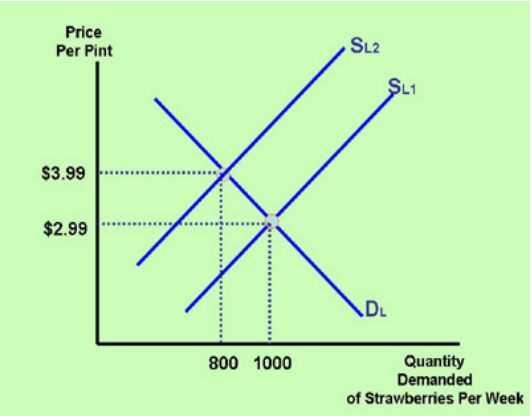

Figure 8: Change in quantity demand.

When one or more of the five demand determinants (see section 2.6) changes, then *demand* changes. For example, when buyers' income increase, the *demand* (not the quantity demanded) for a normal product increases. Or when the price of a substitute product decreases, then the demand for the product in question decreases. Or when the number of buyers increases, the demand increases, and the price of the product increases. An increase in demand is shown by a *rightward shift* in the demand curve. See Figure 9 as a reference. In the graph, demand increases as D1 shifts to D2. *Quantity supplied* also increases as the equilibrium points shift along the supply curve from point A to point B.

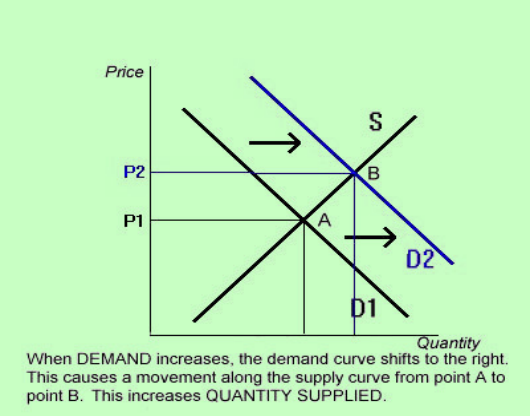

Figure 9: Graph depicts the change of demand going rightwards.

2.11.2 The Difference between Supply and Quantity Supplied

If the market price of a product increases, then the *quantity supplied* increases, and vice versa. For example, when housing prices increase, more people will want to sell their house. See Figure 10 below as a reference of how quantity supplied affects supply.

When one or more of the four supply determinants (See 2.8) changes, then *supply* changes. For example, when technology advances, or the cost of production decreases, *supply* increases. See Figure 11 below as a reference.

2.12 Consumer Surplus and Producer Surplus

Producer surplus happens when the price changed by businesses is higher than the equilibrium (businesses are producing more than what consumers

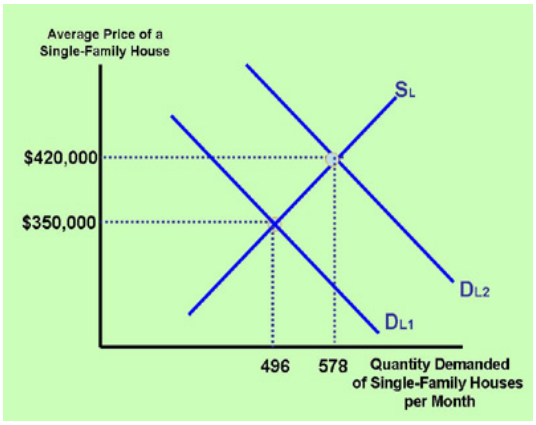

Figure 10: The graph depicts the number of goods increasing as price increases as well.

are buying). Consumer surplus happens when businesses charge at the equilibrium price, but consumers are willing to pay above the equilibrium price since they value the item a lot.

2.12.1 Consumer Surplus

The difference between how much consumers value a product and how much they actually pay for it at the equilibrium price is called *consumer surplus*. Figure 12 below shows the area which consumer surplus lies.

2.12.2 Producer Surplus

Producer surplus is similar to consumer surplus, but it measures the benefits of a trade for producers. *Producer surplus* is the difference between the minimum price at which producers would have been willing to produce the product and how much they are actually receiving at equilibrium. Figure 13 below shows the area which producer surplus lies.

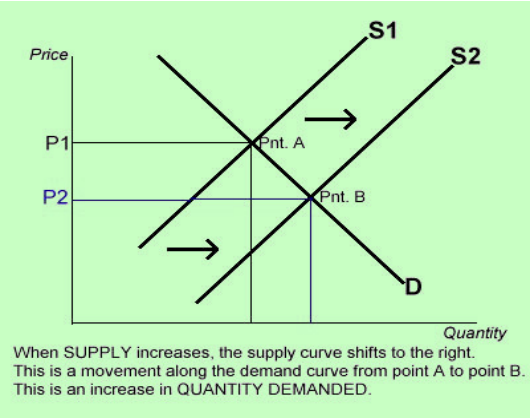

Figure 11: As supply increases from as S1 shifts to S2, quantity increases as the equilibrium points shift along the demand curve from point A to point B.

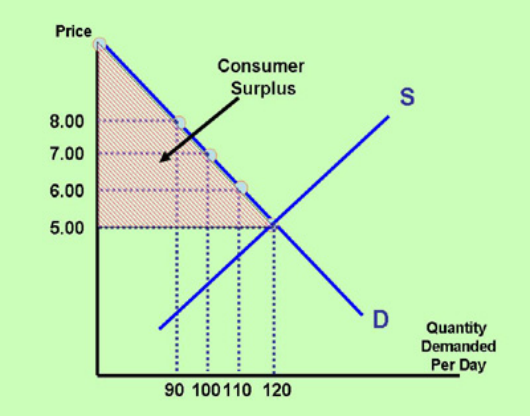

Figure 12: Red area indicates where consumer surplus lies.

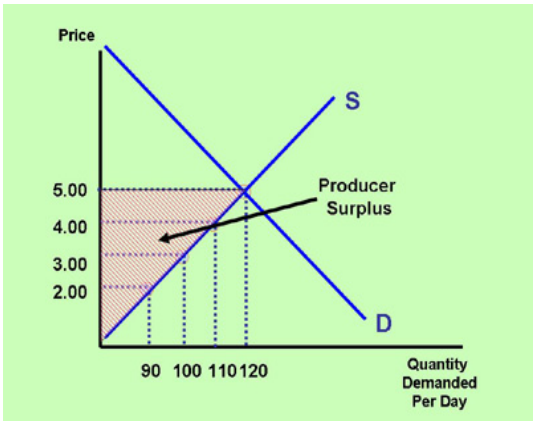

Figure 13: Red area indicates where producer surplus lies.