1 Chapter 1

1.0

There are 6 main issues we will focus on in economics:

- **Definition 1.** *Productivity Growth*

  Productivity is measured by $Productivity = Output/Worker$
  Incentives lead to productivity growth.

- **Definition 2.** *Population Growth*

  Canada is open to immigrants, we have a low birth rate compared to past generations. No population growth leads to less workers, meaning workers must work harder. There are benefits and costs of having children.

- **Definition 3.** *Climate Change*

  Cities in Canada and moving towards bodies of waters. Risk of submersion. Need to think about city design and allocation of people and resources.

  Example 1.1. Farmers' harvests are affected by climate change. Impacts their income.

  Economic impact of climate change is a big issue.

- **Definition 4.** *Technological Change*

  Changing many industries, including education. Automation, job losses but also new job markets. Presently, might technological change may seem to be bad news but the future brings changes.

- **Definition 5.** *Protectionism*

  Has been, unfortunately, on the rise over 20-40 years. Opposed to trade or comes with conditions. Countries have decided to tie trades to labour and climate conditions and standards. Free trade resists protectionism.

- **Definition 6.** *Inequality*

  Highly undesirable, unless you are at the top of the distribution. Not within your control. Income inequality is problematic but has a deeper understanding. There is a difference between unfair and inequal. Need to analyze individual potential.

1.1

Definition 7. *Economics is a social science that studies how we allocate limited resources to satisfy unlimited wants.*

Definition 8. *Social science is the study of people.*

Is the allocation of resources fair? just? efficient? By resources we mean:

- Land (T)
- Labour (L)
- Capital (K)

These resources are also known as factors of production. Note: Money is not a resource, it is a means of making exchange easier. With Land, Labour or Capital you could make use of them on a island alone.

These resources are limited or scarce but **our wants are unlimited**. Even billionaires give away their money for their wants. Scarcity → Choice.

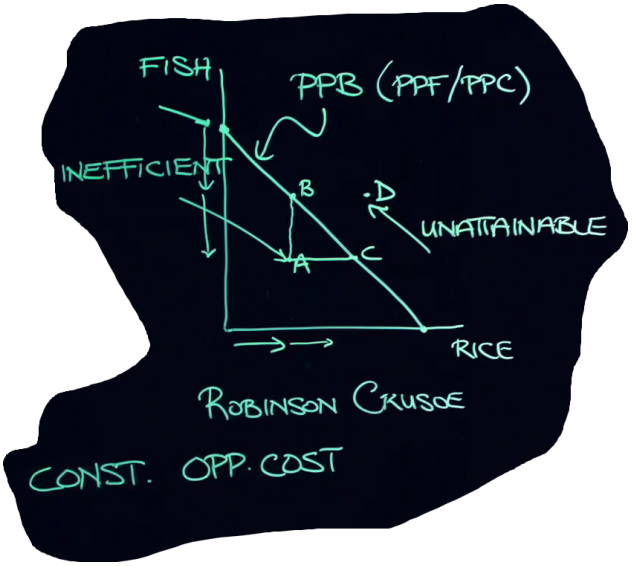

Figure 1: Robinson Crusoe[a]'s Constant Opportunity Cost

[a]Story of a life of comfort to a solitary existence on a deserted island

Naturally we try to equalize the values of rice and fish (EQUITY). If we used all of Crusoe's resources we would get a linear line (PPB/PPF/PPC meaning Production Possibility). Say that point A is below the line. This means it is potential with his resources but we say it is **inefficient**. Same with point B and C but they maximize his resources. Point D is above the line and is **unattainable**, meaning he cannot achieve it.

Definition 9. *Opportunity Cost is the value of the next best alternative forgone.*

Example 1.2. If Crusoe has maximized his use of resources, to acquire more rice, Crusoe must give up some fish. The cost is constant in this example.

Note: In real life, a constant opportunity cost is generally not realistic.

Imagine Crusoe's opportunity cost is no longer constant but increasing. The graph of his resources would be a slope.

Crusoe is able to give up the inefficent methods of obtaining fish/rice for the other initially. To obtain more

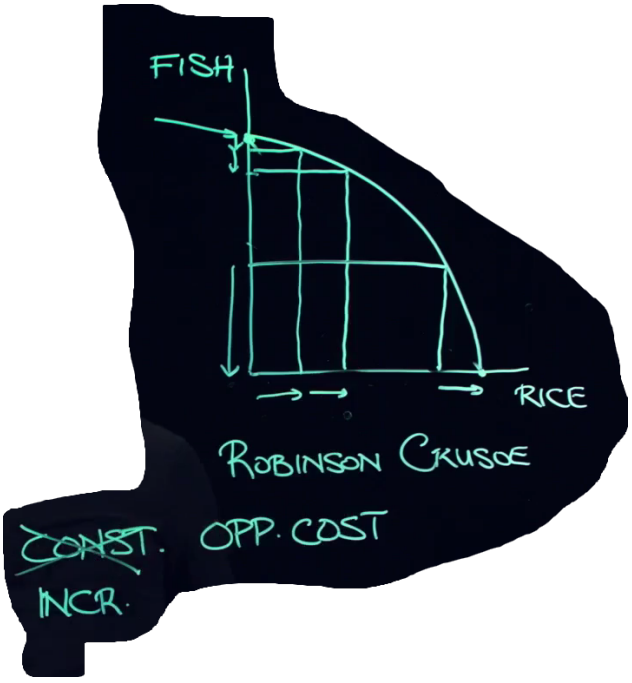

Figure 2: Robinson Crusoe's Increasing Opportunity Cost

and more of the other, he must give up more and more of the other. This is the law of increasing opportunity cost.

1.2

Definition 10. *Market Economy is an economy where resources are allocated through the decentralized decisions of many firms and households as they interact in markets for goods and services. The economy is characterized by being self-organizing and efficient. We assume that the agents of the market are self-interested and incentivized.*

The three agents are individuals, firms and government and are all interested in maximizing something. Individuals maximize utility (happiness), firms maximize profit and government maximizes social welfare (in an ideal world).

Definition 11. *Incentives are rewards or penalties that motivate behaviour.*

Definition 12. *Free Trade is the policy of not discriminating against imports from other countries and relying on the market to allocate resources.*

Definition 13. *Protectionism is the policy of protecting domestic industries against foreign competition by imposing tariffs, quotas and other trade barriers.*

Example 1.3. Let us focus on two agents: individuals and firms and three markets: goods (tangible) and services (intangible), financial and factor. Firms provide goods and services to the goods and services market

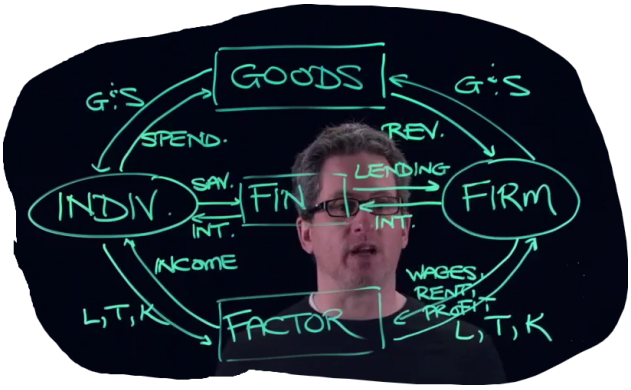

Figure 3: Circular Flow of Income and Expenditure

and expect revenue. The factor market provides firms with resources (T, L and K) and expect wages, rent and profit. Individuals receive income (wages, rent and profit) from the factor market and provide resources (T, L and K). Individuals spend their income on goods and services in the goods and services market. Individuals save their income in the financial market and expect interest. Firms lend from the financial market and the market expects interest.

1.3

Market Economy is generally the most efficient way to allocate resources. However, there are some limitations to the market economy.

Alternatives to the Market Economy:

- Traditional Economy: Resources are allocated based on inheritance and custom.

  "We've always done it that way."

- Command Economy: Resources are allocated by a centralized authority.
- Mixed Economy: Resources are allocated by a combination of market, tradition and command.

Gouvernment's Role in the Market Economy, correcting where the market fails:

- Institutions
- Legal System
- Courts
- Justice
- Public Goods - Goods that cannot be efficiently provided by the market.

2 Chapter 2

2.1

There are two ways to express economic statements:

- **Definition 14.** Positive statements *are factual statements. They do not always have to be factually correct. They just have to be presented as facts.*
- **Definition 15.** Normative statements *are value judgements or opinionated.*

We do not need to worry about muddled statements that could be both positive and normative. Neither positive nor normative statements are better than the other.

Example 2.1.
- Positive: Today is Monday.
  Note: Whether or not today is Monday is not the point. The point is that it is presented as a factual statement.
- Normative: The minimum wage in Quebec is too low.

2.2

What's the process of presenting findings in *Economic Analysis*?

Start with *observations*. As the world changes, our observations change with it. We then develop *theories* based on these observations. Theories consist of variables, assumptions and predictions. A theory is tested by confronting its predictions with evidence.

Example 2.2. We observe that every crisis leads to a rebound.

We then develop a theory into a *model*. These models are mathematical. Models are simplifications of reality. The more realistic the model, the more accurate and the more complex it is. Models have response, independent and dependent variables.

Within the model, there are some variables that are determined within the model itself, some are outside that we drop in and utilize. An outside variable is called an *exogenous or independent variable*. An inside variable is called an *endogenous or dependent variable*, it is determined within the model. Given some parameters, we can this will determine a particular value of this variable in the model. The more endogenous variables, the more complex the model.

In this course, you should be able to differentiate between exogenous, endogenous, indepedent and dependent variables.

Models are based on assumptions. Recall that the Robinson Crusoe model was based on assumptions.

Why do economists disagree?
They disagree because they are making different assumptions which lead to different conclusions. To each

party their assumptions are correct. The role then is to make value judgements, ask: was this a positive or normative situation?

When drawing conclusions, be careful of what you are identifying:

- **Definition 16.** correlation *is a relationship between two variables, positive correlation is when one variable increases, the other increases. Negative correlation is when one variable increases, the other decreases.*
- **Definition 17.** causation *is a relationship between two variables where one causes the other.*

Example 2.3. Women's skirts were worn higher when stock markets were up. This is a correlation. Both the stock market and skirt height were related to economic confidence. The stock market did not cause the skirt height to rise or vice versa.

Example 2.4. Raising bank interest rates reduce consumer and business spending. This is causation. The bank interest rates caused the spending to decrease.

The causation or correlation relationship of some variables today may change tomorrow.

2.3

Data can be collected through the real world or simulations. One type of data is called an index set of data or index number.

Example 2.5. Consumer Price Index (CPI) is an index number that measures the average price of a basket of goods and services purchased by households.

An index number is trying to present a cost relative to a reference period for every hundred dollars. They can be used to measure inflation.

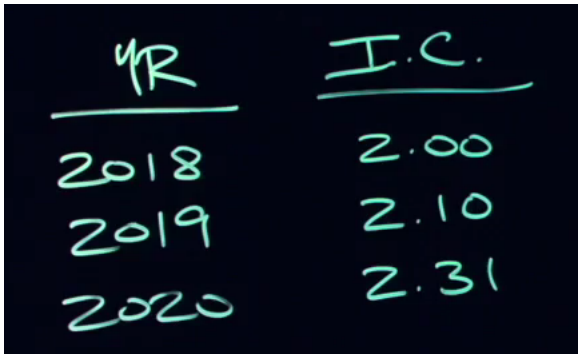

Figure 4: Ice Cap Costs Over Three Years

With an index, we need to select a *base year*. The base year influences the index number.

Let us assume 2018 is the base year.

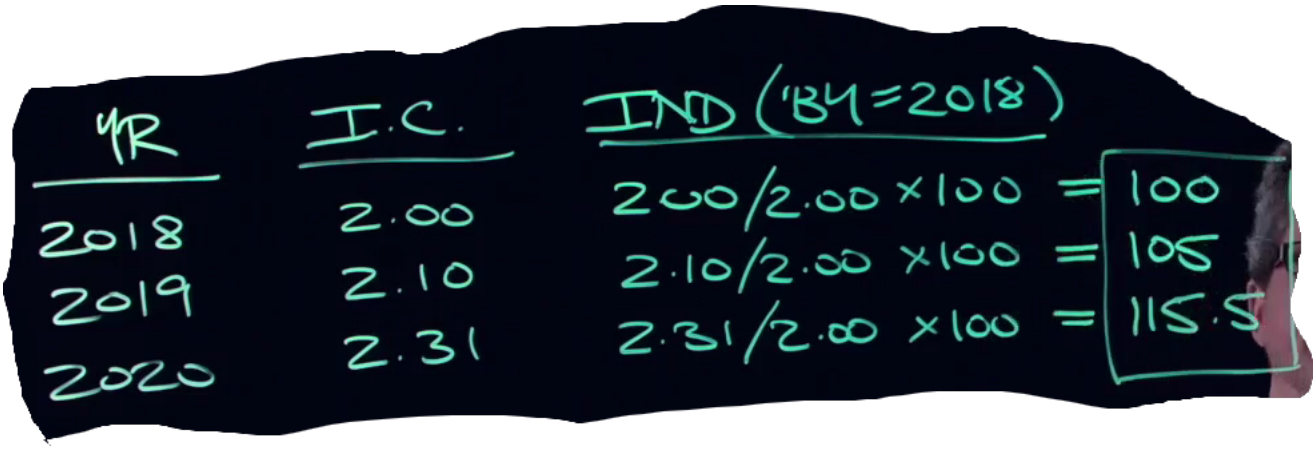

Figure 5: Index of Ice Cap Costs Over Three Years, with 2018 as the base year

$$\text{Index} = \frac{\text{Cost in Year X}}{\text{Cost in Base Year}} \times 100 \tag{1}$$

Composite index is an index made up of multiple items.

Data type sets commonly come in two forms:

- **Definition 18.** Time series data*, looking at particular data over a period of time.*
- **Definition 19.** Cross-sectional data*, looking at a snapshot of data at a particular point in time.*

2.4

Economics is math driven. It is used to describe the real world with models.

Definition 20. Functions *can be expressed in words, tables, equations or graphs.*

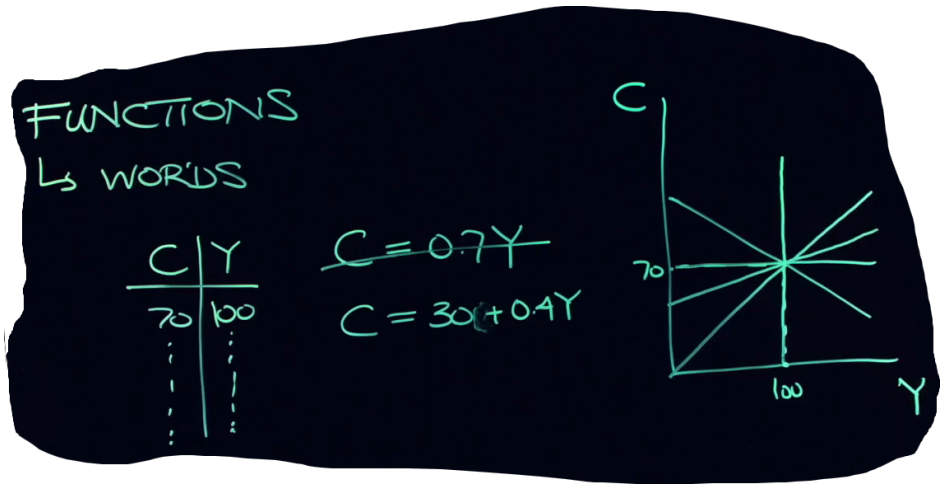

Figure 6: Different Representations of Functions

Most of what is done in intro to economics is done with linear functions. Non-linear functions are interesting because they can be used to find maximum and minimums (optimization).

3 Chapter 3

3.1

Definition 21. Law of demand *says ceteris paribus, meaning all things equal. Demand is consumer-driven. As the price of something goes up, your willingness to buy it goes down. The reverse is true too, as the price of something goes down, your willingness to buy it goes up.*
Note: Technically, the law of demand is as the price of something goes up, your willingness to buy it should not *increase.*

Definition 22. *Demand Schedule is a table that shows prices and quantities. Graphing the demand schedule has the quantity as the dependent variable and the price as the independent variable. Even though this is the case, Price is on the dependent axis (y-axis) and quantity on the independent axis (x-axis).*

Definition 23. *Demand curve is a graphical representation of the demand schedule. Price is on the y-axis and quantity on the x-axis. It is a downward sloping curve, but in the real world it is not always. It is drawn linearly for simplicity, this comes with a problem. If the price was free (y=0) it would break the law of demand. Assume the demand curve is for the entire market for the product.*

Definition 24. *A* shift *in demand is when other factors besides price change.*

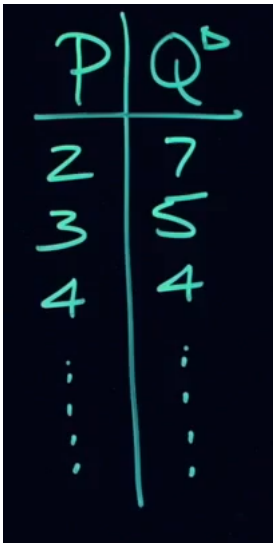

Figure 7: Demand Schedule

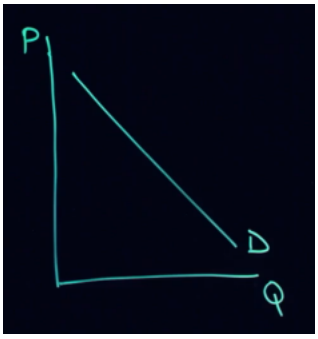

Figure 8: Demand Curve

Example 3.1. If your incomes goes up, given the same price of a product, you would want to purchase more of it. (normal good)
Note: There are some goods that you would want to purchase less of if your income goes up (inferior goods). In this event, there would be a left shift.
The demand curve would shift to the right.
If a substitute product's price goes up, you would want to purchase more of the original product. If the price of a complementary product goes up, you would want to purchase less of the original product (left shift).
If the price expectation (future price) goes up, you would want to purchase more of the product now.
If the number of consumers increases, demand curve shifts right.
All the above scenarios cause a change in demand.
If the price of the product goes up, the demand curve does not shift. This is only a change in quantity demanded.

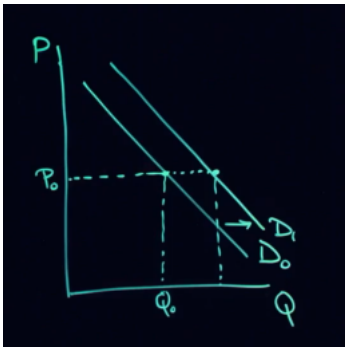

Figure 9: Demand Curve Shifts to Right

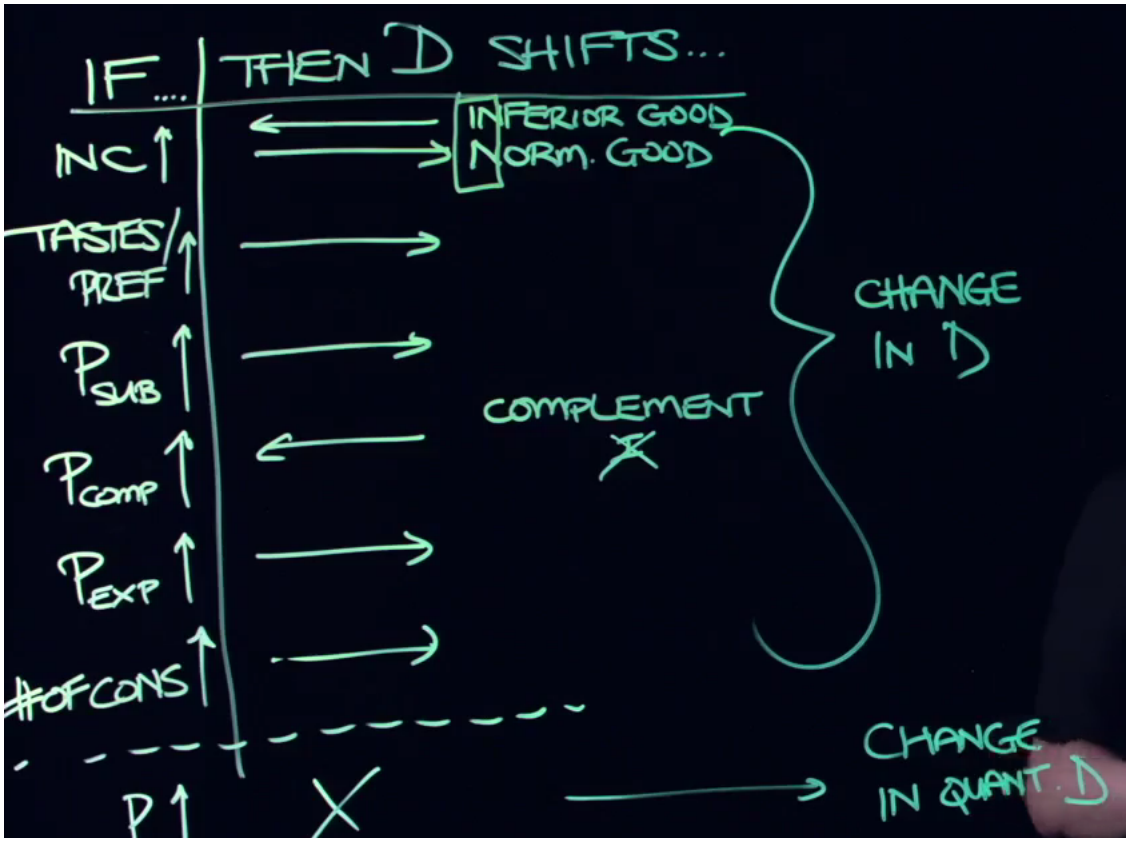

Figure 10: Demand Shift Examples

3.2

Remember ceteris paribus

Definition 25. Law of Supply, *as the price of something goes up, your willingness to produce it goes up.*

Definition 26. Supply Schedule *is a a table with prices and quantities (subscript s). Your willingness to produce a product should not go down as the price goes up. The quantity supplied depends on the price.*

Definition 27. Supply Curve *is a graphical representation of the supply schedule. Price is on the y-axis and quantity on the x-axis. It is an upward sloping curve, it does not need to be linear. The supply curve*

is for the entire market for the product. There exists a price where the quantity supplied is 0 (reservation price).

Definition 28. *A* shift *in supply is when other factors besides price change.*

Example 3.2. If price of inputs (resources) are increased, the supply curve shifts left.

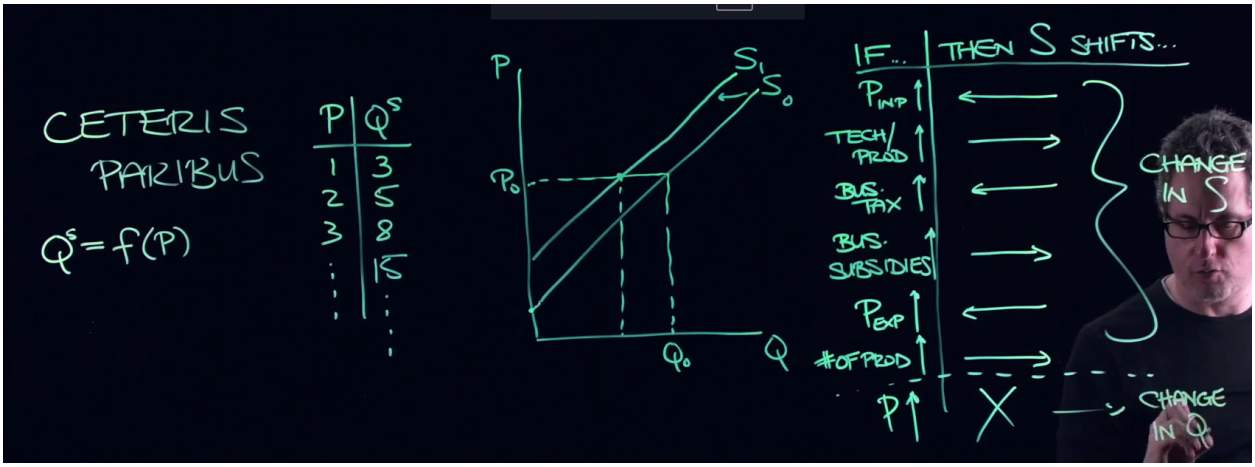

Figure 11: Supply Information

3.3

Definition 29. The equilibrium point *is where the supply and demand curves intersect. Price of the product is the variable that brings the market to equilibrium.*
P^* and Q^* are the equilibrium price and quantity.

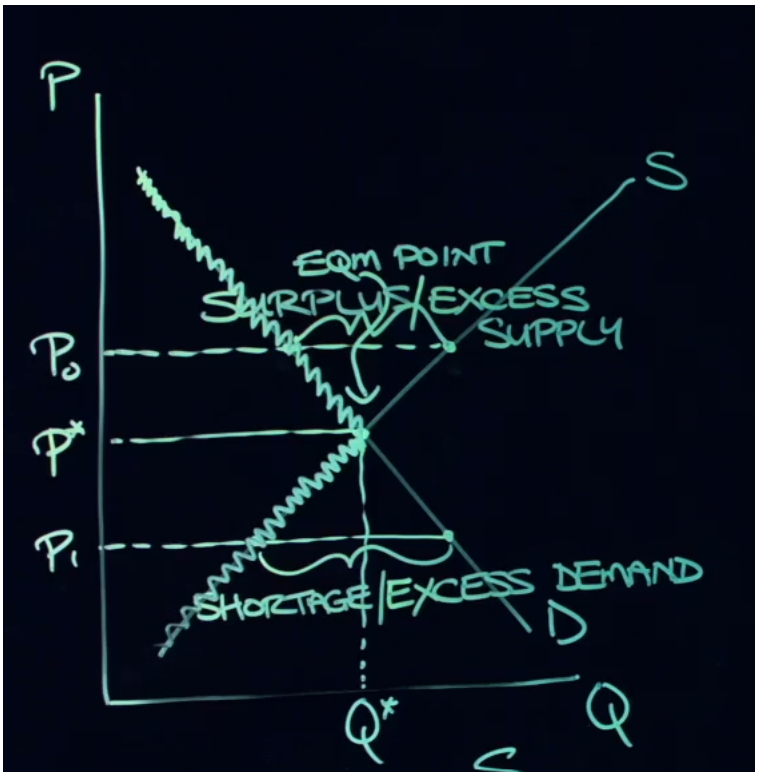

Figure 12: Demand Supply Graph

If prices raise above the equilibrium price, there will be a surplus in supply. If prices fall below the equilibrium price, there will be a shortage.
The invisible hand of the market that guides consumers and producers will bring the market back to equilibrium.
The short-side (left of Q^*) of the market decides what happens.
Laissez faire is the idea that the government should not interfere with the market.
There are 9 different cases of supply and demand shifts.
In some scenarios, for example if supply and demand both shift right, the equilibrium price is ambiguous. The price depends on how much demand or supply shifts right.

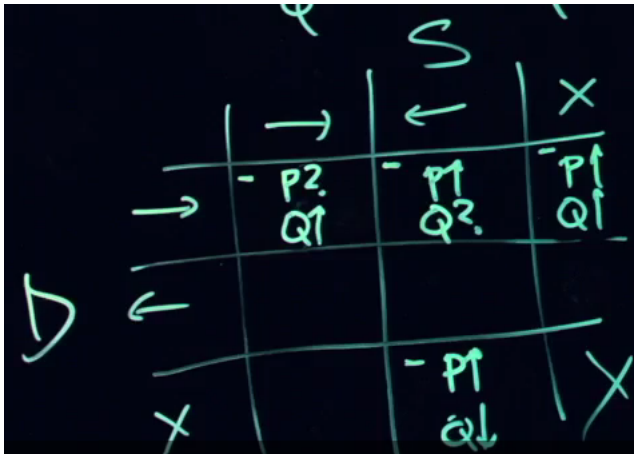

Figure 13: Demand Supply Scenarios

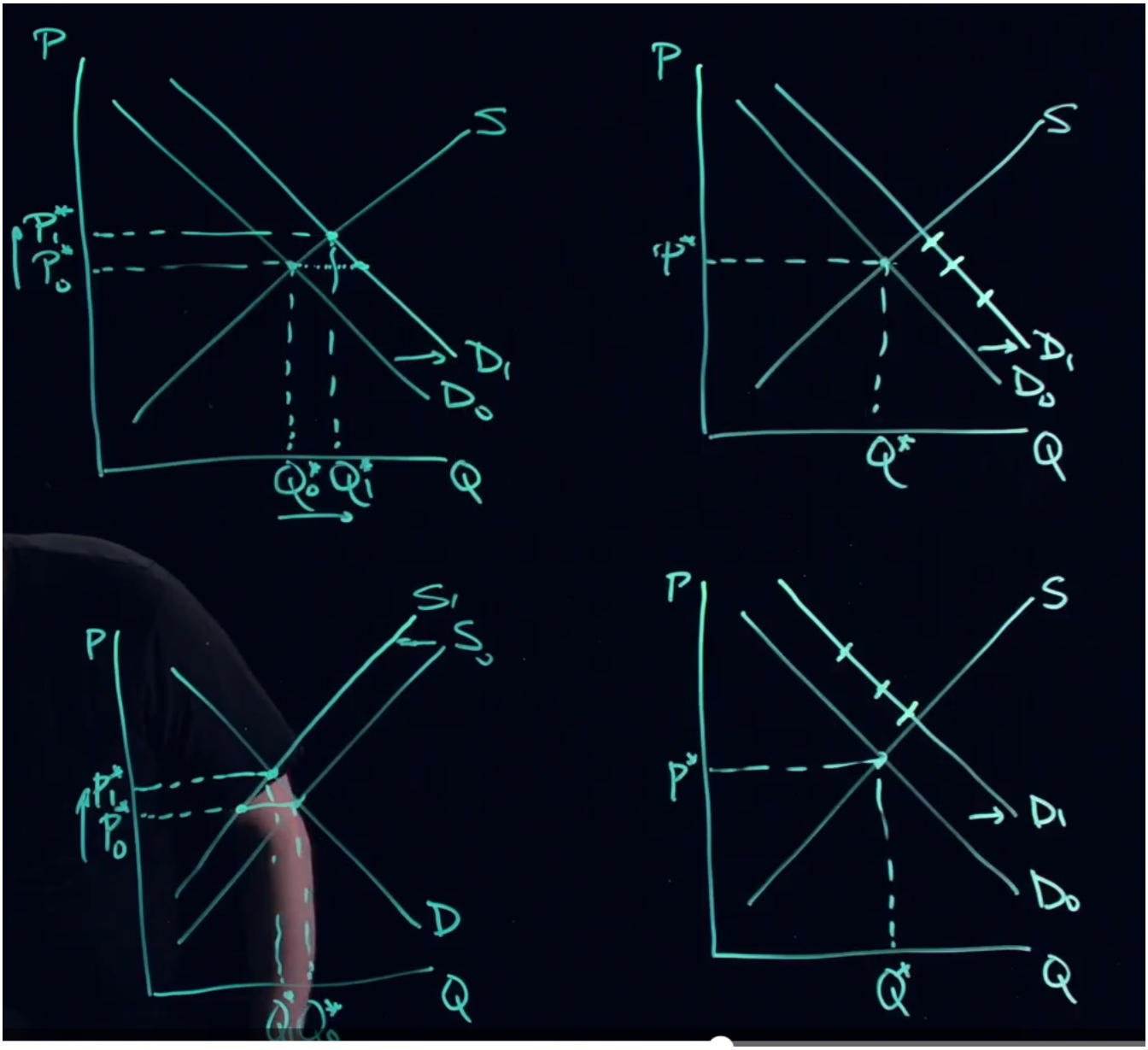

Figure 14: Demand Supply Scenarios