Semester 2: Macro-Economics

Big Picture:

Most countries around the world fall under market based economies where income is generated through the production of goods and services. It is in a government's interest to measure the output of their country and the consumption to determine whether they should intervene in the free market.

Simon Kuznets

During the great depression, the United States government employed Simon Kuznets to develop the first comprehensive set of national income datSa. When creating this report, he encountered the following problems:

- Decrease in the value of goods after they have been produced
- Account for changes in price over time
- Who to survey to gather the relevant information

Eventually in 1934, he published a report outlining the main methodology for measuring a country's Gross Domestic Product (GDP) and eventually won a noble prize in 1971 for his work. He was also well award of the inaccuracies in his work, and in 1962 he said:

> Distinctions must be kept in mind between quantity and quality of growth, between cost and returns, and between the short and long run. Goals for more growth should specify more growth of what and for what.

National Income as a Measure of Economic Activity

Circular Flow of Income

Firms and households within an open economy are inter-dependent, which means that if either one were to stop spending money, the other would too. This is also true if households starts spending more, the firms will be able to expand to produce more goods and services.

However, the circular flow of income must also include the following factors that spends money within the economy, known as injections:

- Government: Spends money in the economy building infrastructure
- Financial Industry: Lend business money so they can expand
- Other Countries: Demand goods and services produced by the country

The size of economies can also shrink when something causes a decrease in spending. During times of economic difficulty, firms will hold back on investment projects and instead focus on saving money instead.

Domestic and National Product

Gross Domestic Product (GDP)

In the modern day, there are approximately 63 000 multinational corporations that account for around 25% of the world's output. As these values are cross boarder, they are not generally included in the GDP count and therefore it will actually be a lot lower than the actual value.

Gross National Product (GNP):

When the net income earned from corporations abroad is considered into the calculation for a country's productivity, this value is known as the Gross National Product (GNP) or Gross National Income (GNI).

Pros and Cons of GDP:

- **Advantages:**
    - *Allows Cross Country Comparison:*

      Having a standard unit of measurement internationally allows for government to compare their economic prosperity to other countries. In the current state of the world as countries are becoming more and more globalized, it is important to know the economic state of trade partners as well as neighboring countries.
    - *Inform Policy Makers:*

      The primary goal of most governments is to achieve sustainable economic growth in both the short and long run. By measuring the changes in GDP every financial quarter (there month span), the country can compare its economic growth to the previous quarter.
    - *Indication of Average Income:*

      When the gross domestic product is divided by the population of the country, the per capita income can be determine and allows the government to access the relative wealth of their citizens.
- **Disadvantages:**
    - *Overestimates the Quality of Life:*

      The GDP value generally overestimates the quality of life within the country as it accounts for many of the factors that does not improve quality of life. Such as when a factory pollutes the environment, even though the GDP increases the quality of life does not.
    - *Does not Account for Income Inequality:*

The GDP does not reflect the income inequality within the country as most countries has their wealthy centered into a few very wealthy individuals whereas the rest of the population live in extreme poverty.

- *Contains Inaccuracies:*

  It is rather difficult to gain the rather excessive volume of data required to accurately calculate GDP. Many third world countries simply does not have enough resources to accurately determine their country's GDP as well as the data could be faked to make a country seem more prosperous than it actually is.

- *Does not Account for Quality of Output Improvement:*

  Many companies improve the quality of their products without much changes in the price, this could lead to misleading statistics as the GDP stays the same, but the product quality has drastically improved.

The pros and cons of GDP can be summarized into a single quote by president Robert F. Kennedy:

> The gross national product ... measures everything ... except that which makes life worthwhile.

Approaches to National Income and Accounting

The Output Method

The output method surveys firm's total output during a given period of time and the value that is added at each stage is counted and not the final product. It is rather difficult to accurately calculate using this method as many businesses such as home restaurants are not included in these calculations and have to be estimated.

The Income Method

The income method measures the total income of the businesses and households within a certain period of time. Similar to the output method, the income method is only effective when the economic activity is registered and logged. This is becoming an ever bigger issue as many of the economic activity becomes un-registered.

The Expenditure Method

The expenditure method sums up the total sale receipts for goods and services within a country. In a closed economy, this measures the consumption within the economy. However, in an open economy, this also includes government spending, investments and net exports. To collect the necessary data, statisticians collect sale receipts, credit card statements and utility bills.

Nominal GDP and GNI

GDP measures the total value of goods and services within a country in a given time period. However, this can be problematic as the price of these goods and services and change over time. If the inflation is high, then the GDP value would be an overestimate of the value of the total goods and service produced and vice-versa. To overcome this problem, a real or nominal GDP value can be calculated where it accounts for the inflated values.

Expenditure Method Nominal GDP Calculation

GDP can be calculated using the expenditure method which involves measuring consumption, investment, government expenditure, net export and spending in the economy. The total expenditure within an economy is known as the aggregate demand (AD).

$$\mathrm{GDP} = \mathrm{C} + \mathrm{I} + \mathrm{G} + (\mathrm{X} - \mathrm{M})$$

- **C**onsumption
- **I**nvestment
- **G**overnment Spending
- **E**xport Expenditure
- **I**mport Spending

The $\mathrm{X}-\mathrm{M}$ value in the equation represents the trade balance within the economy.

Output Method Nominal GDP Calculation

The output method calculates nominal GDP based on the volume of production in each sector of a product's production line. This is interesting because different sectors responds differently to elasticity of demand. Such as during a recession, the necessity of different products will determine its price changes.

Income Method Nominal GDP Calculation

Similar to the output method, instead of summing the production at each sector, the total income of each household of corporation is calculated.

GNI Calculation

Similar to GDP, GNI includes consumption, investment, government spending, trade balance. However, it also includes income earned by the companies abroad as well as income from foreign citizens living within its boarders. However, the income earned abroad is added while the income of foreign citizens is subtracted.

$$\mathrm{GNI} = \mathrm{GDP} + \mathrm{Income\ Abroad} - \mathrm{Income\ Loss\ Domestically}$$

Real GDP and GNI

Real GDP and Real GNI

Real GDP and GNI can be calculated using a deflator factor and more accurately determines the GDP value of a country. The deflator index changes each year based on the total inflation of the country.

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Deflator}} \times 100$$

$$\text{Real GNI} = \frac{\text{Nominal GNI}}{\text{Price Deflator}} \times 100$$

Real Per Capital GDP and Real Per Capita GNI

The real per capita GDP and GNI values can be calculated by dividing the total real GDP and GNI by the population of the country.

$$\text{Real Per Capita GDP} = \frac{\text{Real GDP}}{\text{Population}} \times 100$$

$$\text{Real Per Capita GNI} = \frac{\text{Real GNI}}{\text{Population}} \times 100$$

GDP/GNI by Purchasing Power

The Purchasing Power Parity (PPP) indicates the size of an economy based on its power to purchase goods and services within the country. The PPP value measures the price of goods and services between countries (Ex. compares the price of Big Macs in China to the United States). A country might have lower nominal GDP but a higher PPP due to the price of goods and services being cheaper.

Business Cycle

The economic cycle indicates the fluctuations in economic output activity over time. The business cycle can be broken down into four parts:

1. Expansionary Phase
2. Peak (Boom)
3. Contractionary Phase
4. Trough (Bust)

The business cycle can also be used to determine the long term prospects and potential growth within the company. As can be seen in business cycle graphs, even though sometimes the trough dips below, the overall trend within the company is increases.

Potential output is also rather difficult to measure as it would be like predicting the height of a child and it would be an educated guess at best.

GDP/GNI as a Measure of Economic Well-Being

The GDP/GNI values can be used to compare values over time periods such as decades or be used to compare to other countries as a measurement of economic well-being.

Alternative Measures of Well-Being

While GDP and GNI are adequate measures of economic prosperity, it does not account for the well-being of the country.

World Happiness Report

The World Happiness Report is an indicator of how much happiness plays a role in human and economic development. It asks citizens of a country to self identify their levels of happiness and is rated based on the Cantril Ladder.

OECD Better Life Index

The OECD Better Life Index measures 11 indicators across 35 countries who are members of the Organization for Economic Cooperation and Development. This index has been criticized for its lack of indicator diversity. The indicators measured are:

- Housing
- Income
- Jobs
- Community
- Education
- Environment
- Civic Engagement
- Health
- Life Satisfaction
- Safety
- Work-Life Balance

Gross National Happiness (GNH)

The Gross National Happiness Index was developed in 1970s and takes a holistic approach to economic growth and development.

Happy Planet Index (HPI)

The Happy Planet Index uses four indicators to determine how efficiently residents of different countries are using environmental resources to lead long and happy lives. The indicators measured are:

- Well-Being
- Life Expectancy
- Inequality
- Ecological Footprint

$$\text{Happy Planet Indx} = \frac{\text{Life Expectancy } \times \text{Well}-\text{Being } \times \text{Inequality}}{\text{Ecological Footprint}}$$

Green GDP

As economic growth often leads to severe environmental impact, the negative externalities are considered into the GDP values but is negatively effecting the wellbeing.

Aggregate Demand

Aggregate demand is the total demand for goods and services within an economy and consists of consumption expenditure, government expenditure, investment spending and spending on net exports.

$$\text{Aggregate Demand} = \text{C} + \text{I} + \text{G } (\text{X} - \text{M})$$

Slope of AD Curve

- *Wealth Effect:*

  As the average price level falls, the wealth of participants in the economy increases in real terms as their ability to purchase goods and services improves. The real value of assets, like property or stock, is now higher.

- *Interest Rate Effect:*

  At lower price levels, interest rates are lower too, giving people more disposable income to spend and with which to demand higher volumes of output. The incentive to save is also lower.

- *Net Balance Effect:*

  A lower price level makes goods and services relatively cheaper for foreign countries to buy. Therefore, the demand for exports rises and the demand for imports from abroad falls, increasing the net trade balance and leaving it in an overall better position.

Determinants of AD

Consumption

- *Confidence:*

  When consumers start feeling anxious about the economy or their own economic prospects, they may choose to reduce their consumption, causing a leftward shift of the AD curve and reduced national output. If consumers feel confident about their future income and employment, they will tend to spend more and the AD curve will shift rightward.

- *Unemployment:*

  The threat of becoming unemployed is a big factor of concern for people, but also for annual real incomes. This in turn influences the ability to consume goods and services. Unemployment is an indicator that is closely monitored by governments, especially in relation to seasonal changes.

- *Real Interest Rates:*

  Most people also tend to buy property or other large purchases by taking out a mortgage or loan with the bank and paying back a monthly sum that includes interest. When interest rates fall, this makes it easier for people to borrow money and spend, as the repayment on that borrowing becomes lower. On the other hand, interest rates also encourage or discourage people to save. As

interest rates increase, the incentive to save rises: a leakage to the economy. If interest rates decrease, the incentive to save falls, which encourages consumer spending. Like unemployment, real interest rates are a closely monitored indicator Lower savings and increased borrowing can both result in a rightward shift of the AD. Accordingly, higher interest rates will encourage saving and discourage borrowing and will shift the AD leftward.

- *Wealth:*

  Wealth must not be confused with income. Income is earned when the factors of production are exchanged for their respective payments. Wealth refers to assets and includes ownership of property, bonds, shares of a company, and so on. When asset prices rise in a country, it can provide aggregate demand with an enormous boost as people feel wealthier and more able to spend. This was particularly true in the run-up to the financial crisis in 2008, when the housing market in many countries experienced speculative bubbles as property prices rose. AD in the economy will shift rightward when people feel wealthy, leftward when they feel less so due to falling prices of property or falling value of shares owned.

- *Personal Taxes:*

  The amount that we have to pay in tax to the government varies from country to country but, generally, most countries pay for public services using the revenue earned from taxes. There are many different types of taxes that have to be paid, including income taxes, indirect taxes and import duties.

- *Level of Household Indebt-ness:*

  Most people have to borrow money not only to buy their home but also for other large purchases like university education, cars and home renovations. In some countries, private sector net debt exceeds annual national output several times over. To see how worldwide debt compares. Borrowing money and spending is good for GDP in the short term, as it allows people to increase consumption. However, in the long term, individuals deprive themselves of future consumption to pay back the debt with interest. This will mean a short-run shift of AD rightward that might result in a later leftward shift as debt is repaid.

- *Expectation of Future Price Level:*

  Consumers may decide to spend more and save less if they expect prices to rise in the future. This price rise is called. On the other hand, consumers may decide to spend less and save more if they expect prices to fall in the future. This price fall is called deflation. You will learn about inflation and deflation in the next subtopic. When consumers expect future inflation, they tend to spend more in the present, shifting AD rightward.

Investment

- *Interest Rates:*

  As with consumers, interest rates play a big role in determining a firm's decision to borrow. Sometimes, firms borrow to finance large-scale investment. This is because it is easier to manage repayments with smaller amounts rather than to save the money and spend it all at once. Higher interest rates make borrowing less attractive and can cause investment to fall (AD shifts leftward). In contrast, lower interest rates may encourage borrowing and investment (AD shifts rightward) as long as the perceived reward of that investment through increased consumption is higher than the interest rate.

- *Business Confidence:*

  The health of the economy is important for all businesses as they need to be able to plan for the future. For example, if prices are rapidly rising in an economy, or a recession appears to be looming, firms are unlikely to spend or plan for expansion. They will cut their costs (causing AD to shift leftward). Like consumer confidence, business confidence is closely monitored as a warning sign of an economic slowdown.

- *Technology:*

  Investing in the innovation of technology can ultimately lead to market growth, reduced costs and time saved, allowing countries to make the best use of their resources. For example, consider the video segment on hydroponics, a new way of growing plants without soil. Improvements in technology reduce the need for using more

resources than are necessary and decrease production costs, causing AD to shift rightward. However, technological innovation itself takes time and costs money to develop. It also costs a lot of money to implement the new technology into a business, and training for staff is often required before this technology can be used.

- *Business Taxes:*

  Like consumers, firms also pay taxes to the government. Raising business taxes reduces the amount left for investment and causes leftward shift of AD. Therefore, it is important that taxes are set to an appropriate level. This means that governments are not discouraging firms from setting up businesses in their country or from making investments.

- *Level of Corporation Indebt-ness:*

  Like consumers, firms also borrow money to finance their expansion. This is especially true for entrepreneurs starting new businesses. They will often approach banks to lend them the start-up capital necessary to launch their brand. These debts have to be paid with future earnings and so can slow future investment, causing a leftward shift of AD.

Government

Governments spend vast quantities of money in their economies, such as on hospitals, roads, public sector employees, and so on. What they spend the money on largely depends on their political and economic priorities. Political priorities change as governing parties change in a state. When a new government is elected, it will often have different priorities compared to the last one. As it will have new powers over government expenditure, such as how much tax is levied, different sectors of society will be prioritized, such as education, healthcare, defense, welfare and so on.

Net Exports

Some countries are heavily reliant on their trade balance to generate growth, such as China, Japan and many oil-exporting countries such as the UAE. Trade enables countries to benefit from each other's strengths in production in the global economy. Whilst this is a good thing, it can be problematic if countries become overdependent on each other and too many factors change beyond control. Here are three important factors that may affect trade and net exports.

- *Income of Trading Partners:*

  Economic growth abroad is necessary to sustain demand for exports and, as we saw during the financial crisis of 2008, it is not always guaranteed. The growth of large emerging consumer markets like China, India and Indonesia has provided large boosts in the exports for developed markets like German, Japan and the USA. As incomes have risen in the emerging markets, a greater demand for the exports of the developed markets has resulted in a shift of AD, increasing growth for Germany, Japan and the USA. However, this relationship also means that these economies are linked. A slowdown in consumption in one economy can result in a leftward shift of AD in another, as consumers become less willing or able to purchase the exports. In early 2020, Japan and Germany's growth was impacted when the economy of one of their largest trading partners slowed down and consumption of their goods and services slumped.

- *Exchange Rates:*

  The values of currencies determine the relative prices of goods and services traded. When exchange rates appreciate, more of one currency is required to purchase another, and therefore more money is needed to acquire the same good. This makes exports less competitive abroad, but also makes it cheaper to import goods and services, which will cause a leftward shift of AD. Depreciation causes the opposite to happen. Changes in the exchange rate may affect the aggregate demand, but to what extent depends on the size of the trade balance and relative price elasticity of demand (PED) of imports and exports.

- *Changes in Trade Policies:*

Countries might change their trade policies, which will affect the way that they interact with other economies. They might impose restrictions on the way goods or services are imported from another country, or change the way they support their own industries when competing with foreign firms. Countries can also:

    - Impose taxes on imports, known as tariffs
    - Impose restrictions on volumes of goods imported, known as quotas or voluntary export restrictions (VER)
    - Support their own industries with subsidies.
- Less traditional methods also include exchange rate manipulation and health and safety requirements. When countries increase the level of protectionism, other countries struggle to sell the same volume of goods and services. The aggregate demand then increases for the importing country and falls for the exporting country. For example, in 2019, US president Donald Trump said he would place tariffs on steel and aluminum coming into the US from Brazil and Argentina. This was an effort to protect domestic producers and decrease imports.

Aggregate Supply

As in microeconomics, we have to consider the volume of output that firms are willing and able to provide to the marketplace given the numerous factors that affect their ability to do so. However, in macroeconomics, aggregate supply is treated differently depending on the time period considered: we will consider aggregate supply (AS) in the short and long run for the whole economy.

Short Run AS

Aggregate supply is the total quantity of goods and services produced in an economy (real GDP) over a specific time period at different price levels. The short run in macroeconomics is considered to be the length of time during which resource prices stay relatively constant. Firms do not typically face changing costs on a daily or weekly basis; this would be very unstable indeed. There is, therefore, a positive relationship between

the output that firms are willing and able to provide and the selling price of goods and services in the economy. As firms receive higher prices for the goods that they sell, they will be more willing and able to produce output, as long as their costs of production, especially wages, remain constant in the short run.

Determinants of SRAS

The aggregate supply curve is upward sloping, much like the supply curve you see in microeconomics. Anything that causes shifts in the short-run aggregate supply curve can be broadly categorized as determinants causing changes in costs of factors of production. In the short-run aggregate supply curve, this includes:

- *Resource Prices:*

  Just like you learned in microeconomics, the price of inputs relating to production can have a significant impact on a firm's productive capacity and ability. In macroeconomics, the same is true. However, in this case it means that any price changes will be so significant that they will have an impact on the majority of firms within a country. For example, consider changes in energy costs such as generated electricity or oil. Think for a moment about what might happen if the price of electricity suddenly doubled. Anything that is plugged in or charged is now twice as expensive to operate. Firms would be impacted disproportionately, but al firms would be affected. Sometimes, this happens as infrastructure ages or fails to keep up with population growth. For example, in the US, the electricity provider Pacific Gas and Electric has been struggling to keep California supplied with power due to increasing seasonal wildfires in the region and climate change. As a result, many businesses are facing higher costs in generating consistent electrical power to run their operations across the state and some are even shutting down. When this happens, the short-run aggregate supply curve (SRAS) shifts to the left. This is because the short-term production capability of firms, as well as the number of firms in the economy, decreases. Of course, the opposite can also be true. If energy prices fall, then the SRAS will shift to the right as resource prices to firms are reduced.

Another example of changes in resource prices is the cost of labor. Labor costs are the major costs for firms, so any increase required by the government in wages and salaries, such as changes in minimum wage legislation, will affect the production costs of firms across the entire economy. It should be noted that wages and salaries usually do not decrease as labor contracts are usually signed on a fixed wage, labor unions resist wage cuts, and firms avoid wage cuts as it affects morale and productivity.

- *Government Intervention:*
    - Regulation:

      economy face. This allows firms to retain or spend more of their revenue to meet those regulations. Although regulations are meant to keep workers safe, the environment clean, and market movements fair, it is argued that they can slow economic growth if they become outdated or oppressive. Firms are unable or dis-incentivized to invest in more and better factors of production.

    - Changes in Business Taxes:

      Governments can lower taxes for citizens, which provides them with a greater disposable income. This enables them to consume more and boost the aggregate demand in an economy. Similarly, governments can lower taxes for businesses, which allows them to keep a greater share of their profit. This means that they can reinvest their money to increase the number or efficiency of the factors of production that they use. Governments, such as China, will often extend a tax cut to businesses when they see private investment in the economy slowing down.

- *Government Subsidies:*

  Governments may provide subsidies to firms in order for them to be able to expand on their productive resources, whether it is in quality or quantity. Governments might decide to provide these subsidies in one of two different ways. For example, they might decide to subsidize:

    - An industry that holds a large share of the nation's economic capacity. In many less economically developed countries, there is not an industry that would fit this criteria as they are many and

varied. However, in some developing economies that are commodity driven, such as Nigeria or Ghana, subsidies may have a large enough impact to shift the SRAS curve (although this happens rarely).
    - An energy provider. As you have seen in the Resource prices subsection above, if energy production is subsidized, that means prices for energy will decrease. This results in cheaper production costs for many, if not all, firms in an economy. While many citizens enjoy the low energy prices, the removal of a subsidy can have a wider economic impact: for example, the proposed fuel subsidy cuts in Ecuador sparked widespread violent protests in late 2019.
- *Supply Shocks:*

  A supply shock refers to what happens to the overall aggregate supply in a country when it is affected by an event. In the 1970s, the Western world experienced a supply shock as the price of oil rose sharply. All firms in the economies of Western countries were impacted by this, as they all used fuel derived from oil for energy. Supply shocks can also occur if there are large-scale natural or human-made disasters that delay or destroy the regular production of a business in the short run, such as droughts, wildfires, floods and financial crises. Climate change is especially harmful to countries that rely heavily on agricultural products for export revenue, such as economically developing nations. These environmental factors and their impact are expected to worsen over time.

Keynesian Model

John Maynard Keynes was an economist from the United Kingdom, a Cambridge University professor who had much success as a policy advisor during World War I. He became a controversial figure when he walked out of negotiations for the Treaty of Versailles as a protest against the huge interest rate payments that were to be demanded from Germany. His main contribution was to explain why the economy was not recovering in the way that the new classical school suggested it would. His reasoning was that resource prices exhibit downward inflexibility. Some of Keynes' most influential work was right in the middle of the

Great Depression, a time that clearly illustrated his ideas. The Keynesian AS curve is divided into three sections:

- The horizontal section, where there is a good deal of spare capacity in the economy
- The upward sloping section, where there is some spare capacity but we are beginning to see some competition for scarce resources
- The vertical section, where full employment is reached

Unless wages fall, firms have no choice but to make workers redundant during a recession. This is because they sell fewer goods, as aggregate demand is low, and so look for ways to keep profits from falling. This explains the gap between Y_1 and Y_{fe} and the resulting unemployment in the labor force. Firms find it very difficult to reduce people's wages, although it is not impossible to do so. Firms are also very reluctant to reduce the prices of the goods and services they sell. There are more likely to be other areas where costs can be cut rather than reducing prices and, subsequently, revenues. All of this depends on the severity and duration of the crisis, and wage and price cuts are more likely to occur in very deep or long-lasting recessions. It is only when the economy nears Y~fe ~and resources have to be allocated between competing uses that prices start to rise.