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LECTURE 1 – THE NATIONAL FLOW OF INCOME (GDP)

Macro-economics - we're going to deal with the large scenario of the economy. Dealing with concepts such as the GDP, government, consumption, investment, inflation, unemployment etc.

We study economics because there is a common problem that every country in the world is faced with – scarcity of resources. Over here, we're going to deal with the transactions involved.

An economy is a concept whereby there is a transaction involved. To be able to execute a transaction, it's not a must to have money (trading is also a transaction).

The 2 most basic actors that we have for a simple economic model are:

- **Households** - provide firms with labour.
- **Firms** - provide households with goods and services.

For the labour services rendered by households, firms pay households wages and with those wages, households are able to purchase the goods and services. On the other hand firms are able to sustain their selves because they realise profits from the goods and services consumed by households. If there are at least 2 actors/players, then we have a basic form of economics activity.

Another important institution in this national flow of income are **Banks**. Why are banks so important? Because most of the time resources are not equally available to everyone. When we're young we don't own enough resources to purchase a home or a car. Should we wait until we accumulate enough resources to get hold of that particular good? No. To facilitate the consumption, banks are there as an intermediary institution whereby they channel resources (savings) from those who have a surplus to those who need additional resources (in need of credit) because they have a shortage. Therefore banks are there to gather the savings from households and those savings are made available to firms and they can be used in the form of investment. Firms need capital to produce more output so that we have more economic activity and therefore if we save, there are more resources available with which we can produce more output. Save part of your output so that you can create more output from it. It is very important to have savings, so that we can have investment and create more consumption in the future.

People can consume only if they have enough resources. With the help of banks we are able to get more access to credit and with that facility we are able to consume at a much faster pace and therefore there is more economic growth.

Another important factor, is **Government**. This is a public institution. There may be situations where the market fails to deliver something. Government is there in the economy to try to balance things out. We're going to focus on the business cycle. For the past 7 years, the world economy went through a significant recession and it is still quite present in some member states in Europe. Therefore there are

business cycles whereby the economy performs well or not. Government is there to try to smoothen out these cycles. The more stable the economy is, the better. Whatever goes up, must come down therefore if we have a more smooth cycle, it will be more desirable because the economy is exposed to less shocks.

Government collects taxation from households (even from firms but trying to keep the model simple) and then government spends that money in the form of government expenditure and that expenditure is spent on goods and services (education, health etc.).

On their own, these 4 players add up to what we refer to as a **Closed Economy**. Closed because there is no form of economic activity with foreign parties.

To complete the model, we have to include trade with foreign countries. With respect to trade, we have **Imports** and **Exports**. We have households that are consuming and we have firms that are exporting to other countries. When we include the trade component to the closed economy, now we have an economic model which is considered to be an **Open Economy**. The degree of openness varies between one country and another.

Openness is defined as the exposure/dependency of a country on trade. How much a country is exposed to trade and whether we are reliant or not. It is calculated by taking the average of exports and imports, divided by GDP.

$$Openness = \frac{X + M/_2}{GDP} \times 100\%$$

The economic openness of Malta is between 95 and 100. This means that we are heavily reliant on trade therefore if we want to grow in economic terms, we have to sell stuff abroad. US and Germany are in the whereabouts of 20 to 25. Their exposure to trade is much smaller than ours. They are big countries so they can generate economic activity on their own. They don't need foreign countries as much as we do.

Jargon terms:

- **Injections** – a flow of money that is coming into the economy. If we export goods and services, foreign customers will pay us so that is an inflow. If government spends money into the economy, that is money forming the circular form of income. If we have foreign investment, that is money that is going to circulate in the economy. Injections increase economic activity.
- **Withdrawals** – outflows from the flow of income. If we import goods, then we are consuming but we're paying foreign countries for it. Therefore, that is money leaving our economy. We have taxation. In order to finance its expenditure, governments need to raise taxation and every euro taxed is a euro flowing out of the national flow of income. If there is not enough demand for investment, the more we save, the less we're going to consume. The more savings there are, the more withdrawal for the economy.

For economic growth to happen, we have to have more injections than withdrawals. From this system, the injections re I (investment),G (government) and X (exports). The withdrawals are S (savings) ,T (taxes) and M (imports).

We refer to injections as **Exogenous Variables**. These are variables that are not influenced directly by the economy. If we're going to export, the demand for our exports, does not depend on how much we would

like to export but depends on the foreign demand. Injections act independently from what happens in the economy.

We refer to withdrawals as **Endogenous Variables**. These are variables that are directly influenced by the economy. If there is a recession, and as a result we expect unemployment to increase, people will have less income available, they are going to save less, government is going to have less in taxation and we are going to consume less so our demand for imports is going to be less.

What is **GDP (Gross Domestic Product)**? It is defined as the value of the goods and services produced by a country during a calendar year. Why is GDP important? The goal of every country is that of improving the wellbeing of its population and their standard of living. There is a national agreed concept of how this should be done and that is GDP. It is the best tool that we have of how we can get at least a proxy of what the standard of living is for a particular country.

How to calculate GDP? There are 3 different ways which should give the same result. Ultimately at the end of the day we're dealing with the same model so the only difference is that we're looking at it from different sides. There is a purchase which is equivalent to the sales which are accrued in wages and profits. Expenditure is always higher than income. Many people don't declare what they are earning. From GDP we can have an estimate of the degree of tax evasion. 3 methods:

- **Expenditure** – the most reliable for Malta. **Y = C + I + G + X – M + TAXES - SUBSIDIES**. Y is GDP (also referring to national income – aggregate income). C is household consumption (accounts for about 60% of the GDP but this stands to fluctuate). I is investment which is anything that will give us some form of return or capital. Investment can either be public (carried out by government) or else carried out by the private sector (the ratio is about 80 private:20 public). G is government expenditure. With respect to G, we have to be very careful because not all government expenditure is taken into the GDP (it is about 3 billion euros). In GDP we have to only take in account the transactions that involve the production of goods and services and not all government transactions involve these transactions. Out of these 3 billion, 1 billion is spent on welfare (pensions, social benefits, stipends). That amount of money should not be included in GDP. X and M are exports and imports. We sum up exports because that is an inflow but then we deduct imports because that represents an outflow. When we calculate GDP, in our final calculation we also have to take into account, taxes on production (the final value of a particular good), eliminate any subsidies that are available (public transport) and finally we manage to get the GDP (our 7 billion).
- **Output** – very difficult to calculate in Malta because human resource is in limited supply and it takes quite substantial work to calculate output and the system itself is not so sophisticated. Under output we have to take into consideration all the output produced by all entities (business activities). First we have to take note of all the Output (another word for sales), then from Output, we have to deduct what we refer to as **Intermediate Consumption** (electricity, water etc.). It is any expenditure incurred to produce a particular good with one exception (wages). If we only add up the total output, we will be double counting. The Gross Value Added is what we manage to add with economic activity. We just take into account what that particular business activity manages to produce by its activity. That is why we pay VAT (Value Added Tax) on

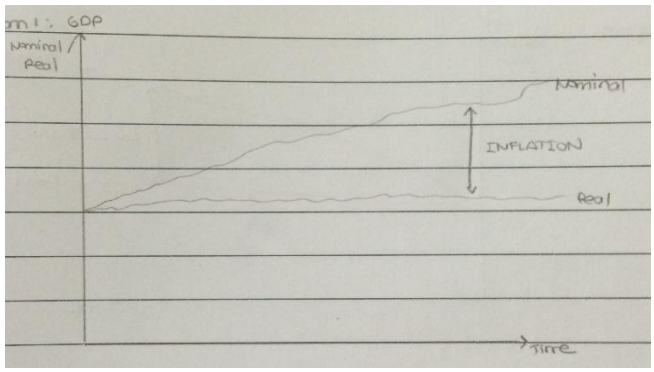
everything that is produced locally. We have to add taxes and deduct subsidies and we get our GDP. **Y = GROSS VALUE ADDED (Output – Intermediate Consumption) + TAXES – SUBSIDIES.**

- **Income** – the least reliant of all in Malta because there is a lot of tax evasion. **Y = WAGES + PROFITS + RENT**. These 3 main components give us the income computation of the GDP. It is grossly underestimated for the simple reason that not everyone declares his income to a ovoid taxation on it. It's only during the past recent years that government is finally communicating with its departments (linking the databases together) to try to address abuse.

LECTURE 2 – GDP AND CONSUMPTION

GDP in Nominal or Real terms

Nominal GDP/GDP at Market Prices/GDP at Current Prices – includes reference to inflation. The measurement of goods and services for a particular year and we're actually measuring how much is the worth in the market i.e. if the price is 25 then that is the GDP in prices (how much we have to pay to consume it).



Real GDP/GDP in Volume Terms/GDP at Constant Prices – inflationary element is removed out of it. The inflationary element contributes to a higher price and the GDP in prices will increase but in real terms (volume terms – how many we produced) we have to remove that increase in price such that we observe only the increase in volume.

The gap between the curves represents inflation.

What is the mechanism that we have to use such that from the Nominal we remove the inflationary component and get the Real? We have to use what is referred to as the **GDP Deflator**. The nominal is inflated with the increase in prices therefore we have to deflate it (remove that upward pressure in prices that is brought about by pure increase in prices). There can be an increase in price because the quality of something improved and therefore there is a justification behind the increase, but there can be just a pure increase in price without any form of justification (the producer simply increases the price just because there is the need – pure inflation).

The NSO constructs an index which is rebased (starts) from a 100 every 10 years. In 2010, NSO resets all indices with respect to all goods and services in the economy to 100. In 2010, the nominal is 100, and in real terms it is 100 as well (starting point). In 2011, there is no qualitative improvement (no justification for an increase in price). The real should remain as 100 but nominal goes up to 105 (pure inflation).

The Deflator will move out the inflationary aspect from our numbers by calculating:

$$Deflator = \frac{Nominal}{Real} \times 100\%$$

We are calculating the value of what we are producing. When we are working out the Real, we are removing inflation. A change occurs either when we are producing more or improving the quality. Whatever value we have at the Real, that value is calculated at the base price (2010 prices). In 2020, they will rebase (start again from a 100) and will recalculate GDP in 2020 prices. They do this in order to keep

track on what is happening from a volume perspective. What is happening to output over time in prices of a particular year? That is not the same thing with respect to the Nominal. When we are measuring the Nominal, we are including both the Real (volume and quality) and the inflationary aspect. The deflator is an aggregation of thousands of goods and services produced by the economy:

$$\frac{Nominal}{Deflator} \times 100\% = Real$$

Whenever we discuss economic growth, we always discuss it in terms of Real growth i.e. whether the economy is managing to produce more goods and services. Internationally, there is this consensus whereby economic growth should be measured in Real terms.

Which is the most important measurement of GDP? It depends. There is no clear cut answer because it depends according to the economy that we are discussing. Let's compare Malta (small economy) with Germany (large economy). In Malta, our economy depends on the tourism industry (one of the main pillars). In market prices, tourists spend money and we calculate that money but if we had to assume that we manage to attract (in volume terms), half as money tourists but they manage to spend the equivalent, so in volume terms we register a growth (same amount of money spent by half the tourists) which is far better. In Germany, most of what is consumed is consumed internally so if a German producer increases the price, that increase will burden a German consumer. If in Malta we manage to sell a holiday for a higher price, it would be even better than trying to attract more tourists who have less money to spend. Given that we are a more open economy, the Nominal is more important than the real. We have a very limited capacity of how much we can produce. We have to produce something and manage to sell it at a higher price. It's going to be measure in Nominal terms. In Germany, it doesn't make sense to produce something and sell it at a higher price (the gain of someone is a loss to someone else). It depends on whether the economy is a closed or an open one. There is a limit to how much we can increase the price with respect to what we are exporting because of competition. We cannot expect to increase our prices more than we can afford to do because otherwise we will be uncompetitive with respect to prices.

Therefore both measures are important but depends on which measure is relevant to the economy we are discussing. If we would like to monitor what is happening to the volume (worthiness), we have to look at the Real. If we want to measure what we are selling each year, we have to measure the Nominal.

Why isn't GDP a perfect measurement of welfare (shortcomings)?

- GDP does not take into consideration non-market activities. When they are making necessary calculations at NSO, they don't take note of activities that don't involve a monetary transaction (voluntary).
- GDP is grossly underestimated – there are certain activities (even immoral and illegal ones) that are not taken into consideration. Consumption of drugs, prostitution (millions of euros involved in these industries). Black economic activities – economists tend to estimate that each economy in the world is 10% undervalued because of black economic activities.
- We must take note of the population. If we had to compare our GDP to Ethiopia's, their GDP is much bigger in absolute terms, but ours is much bigger per capita basis.
- We have to compare GDP not only per capita basis but also per purchasing power standard/parity. The big mac index (how much a big mac costs in different countries) used as the

rule of thumb to compare how the exchange rate and the standard of living impact on the value of a currency.

- A higher GDP does not mean we are improving welfare – for example spending more money on military activity. It doesn't mean we are improving our welfare (perhaps the other way round). We have to focus more on where the money is going.
- We fail to take into consideration Externalities – there is this notion that the more we produce, the better our welfare will be. We are causing damage to the environment the more we produce and the more we consume. We are doing irreversible damage to the world. That cost is never taken into consideration. We have to take into account all the damage that we are inflicting, even on our health.

GDP is not that perfect yardstick at the end of the day to measure welfare with. In the absence of any other method that is internationally accepted, we have to live with it. GDP is an important yardstick used by different countries/policymakers for different outcomes. It is a must that internationally, there is wide acceptance of it. At the end of the day, we still have to rely on something that is imperfect.

C (Consumption)

Y = **C** + I + G + X – M.

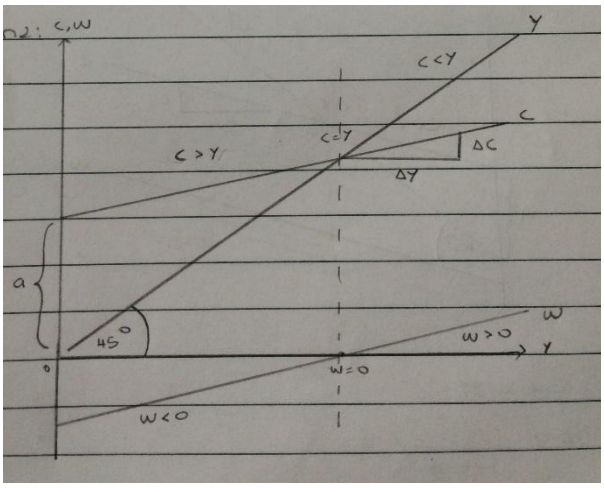
Let's assume that Y = C + S. You're earning something and you can either consume or else you can save or both. If Y = 0, we are going to consume something that must be financed through the savings (-S = C). If I am obtaining some kind of credit, I am dissaving (owing money).

GDP from the Expenditure side is equal to the Output side. Y = AD (Aggregate Demand). If Y = C + W (W = withdrawals = S + T + M, such that T and M are 0) and AD = C + J (J = injections = G + X + I). Therefore, W = J (the withdrawals are equal to the investment).

An endogenous variable is that variable that is influenced by what happens in the economy. We are going to endogenise C in our Keynesian equation such that C is influenced by what is happening in the economy. My consumption is going to be influenced directly by what happens in the economy.

Let **C = a + bY** therefore Y = (a + bY) + I + … Any shock that influences Y is going to have a direct effect onto my consumption.

a is referred to as **autonomous consumption**. It is a given value that is not influenced by any other. Autonomous refers to that part of consumption which is not influenced by income and that is why the a stands on its own. It can never be negative, otherwise its economic meaning would be compromised. Whether we have an income stream or not, we still have to consume something, otherwise we cannot manage to survive. That is why the a bears a positive value.



The Y curve is a 45degree line because Y = C + W.

Comparing Y with C:

- W includes savings (assuming taxes and imports are 0). In the left hand side (until the 2 intersect), C is greater than Y so of course we have dissaving. We are consuming more than we are earning and therefore we are financing that consumption via dissaving.
- The moment C = Y, our W=0. What we are earning is what we are consuming.
- In the right hand side of the diagram, C is smaller than Y and therefore W is greater than 0. We start to accumulate savings.

The b represents the gradient of C, meaning that b represents the change in C over the change in Y. It explains the **MPC (Marginal Propensity to Consume)** is defined as by how much consumption will increase, given a unit increase in income.

$$b = \frac{\Delta C}{\Delta Y} = mpc$$

The value of b will be less than 1 but greater than 0. Therefore, b is going to be a fraction. It cannot be a 0 or a 1, otherwise our multiplicative effect won't work out.

The 0.8 means that for every 1 euro increase that we experience in our income, we are going to consume 80 cents.

$$Consumption\ Multiplier = \frac{1}{1 - mpc}$$

Because we have endogenised C (C is now influenced by what happens in Y), that endogenous effect is leading to this multiplicative effect such that the positive shocks arising from the exogenous variables (variables that are not influenced by what happens in the economy). If there is a positive shock out of them, that shock will have a multiplicative effect onto the economy. What applies in good times, applies also in bad times.

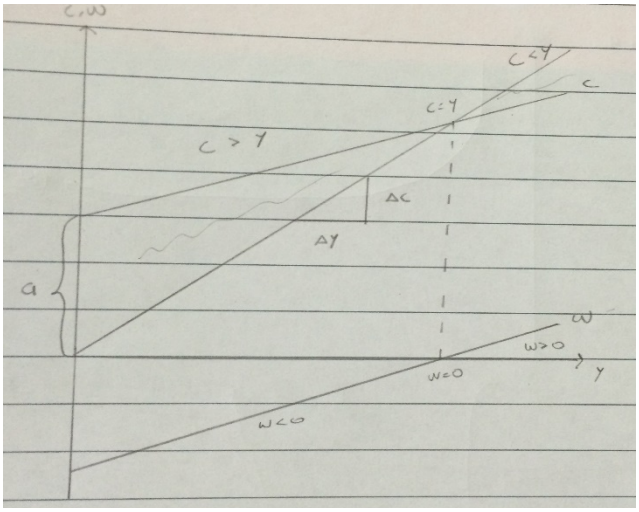
Asymmetric Shocks – as human beings we react differently to positive and negative shocks. We react more negatively to bad outcomes rather than more positively to good outcomes.

In reality, a negative shock will be lower than actually valued. When people experience a drop in income, they don't immediately react to it. People won't immediately cut their consumption by the equivalent amount. They will dissave and when they can't do otherwise, they will cut down on their consumption.

The multiplier, explains by how much any shock that arises from our exogenous variables is going to influence our Y.

LECTURE 3 - CONSUMPTION

C = f(Y). We're going to endogenise our C. Endogenising C means that we're making C as a function of Y. C is dependent on Y. **C = a + bY**. a is a positive value that is not linked with Y. Irrespective of our level of income, we still have to consume something. C starts way above the origin such that the difference between its y-intercept and the origin is described by a (**autonomous consumption**). Whether we have some income or none at all, we still have to consume something. b (**beta**) represents the **mpc (marginal propensity to consume)**, meaning by how much our consumption is going to increase if there is a one unit increase in income. Given a particular change in income, we notice that we increase our consumption. In a way the marginal propensity to consume (beta) reflects the gradient of the line (the steepness of our curve). 0 < b < 1. Our mpc must be a fraction.



In addition to our consumption curve, we can also add income. Y = C + W. We can either spend our income on consumption or else dedicate part of it for saving. It can also be taxed or we can decide to import goods from abroad. These 3 are summed up in W. When W = 0, Y = C; C > Y implies dissavings; Y > C implies savings.

Why is the mpc an important concept in this topic? Keynesian equation becomes: Y = (a + bY) + I + G + X – M. At the end of the day, b will have an impact on Y. Let's consider one of our exogenous variables going up by 10 million. That 10 million will impact on Y (it will go up by 10) and this Y will also have an influence on the Y contained in a + bY. If b = 0.8, our multiplier is equal to 5 (1/1-0.8).

$$mpc + mpw = 1 \therefore Multiplier = \frac{1}{mpw}$$

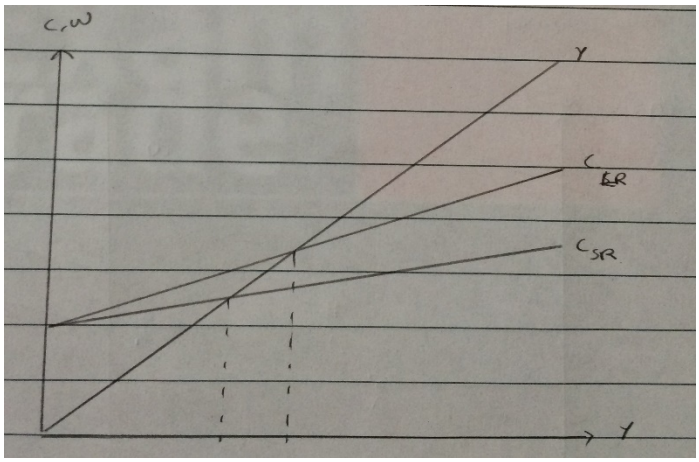
That is why the mpc must be less than 1 but greater than 0. **mpw** (marginal propensity to withdraw) is divided in either mps (marginal propensity to save), mpt (marginal propensity to tax) or mpm (marginal propensity to import). We know how much is the exogenous shock and the multiplier, so if we multiply the 2, we know what the end result will be.

A potential exam question: **Why is the degree of openness of an economy relevant to the multiplier?** Why is it that Malta and Germany have a different multiplier? Why is trade important? Why is the structure of an economy relevant to the multiplier? Let's assume that we can either consume or import. Y = C + M. If the mpc + mpm = 1, it means that if we are exposed in a very significant way to imports/trade, the value of

mpm is going to be quite high such that let's say mpc = 0.4 and mpm = 0.6. If we work it out, the multiplier for Malta will be equal to 1.67 (1/0.6). In the case of Germany, where their exposure to trade is just about 20-25% of their GDP, we have the previous multiplier (1/1-0.8 = 5). The less a country is exposed to trade, the higher the multiplier and vice versa. Given that we import most of the things, spending 10 million, is not going to have the same multiplicative effect as in Germany. Our exposure to trade is much higher than theirs. The Maltese government helps in providing workforce instead of offering money for consumption, since we import most of the things we consume and it would leave our GDP. It is all about if the mpc is higher related to the other variables. The smaller the country, the more the country is dependent on trade. There is not enough momentum for the country to generate growth on its own. There's no other option rather than importing.

<u>Short-Run and Long-Run</u>

Discussing factors that influence the mpc. C_{lr} is higher relative to C_{sr}. The change in consumption in the short-run is smaller relative to the change in consumption in the long-run. This means that we tend to take a significant amount of time to decide whether what is happening in terms of changes in income are going to be permanent or not. People take time to decide whether they can change their consumption patterns in a permanent way. Given that we are risk-averse, we have to be sure (more than 100%), that if our income is going to increase, it's going to be of a permanent nature rather than for just a short period. We need time to change our behaviour. If we are more convinced that what we are earning is going to keep coming in for the foreseeable future, we adjust our consumption pattern (our mpc will increase over time). The same change in income, leads to higher consumption in the long-run. The responsiveness is more significant in the long-run.



Factors that influence the mpc:

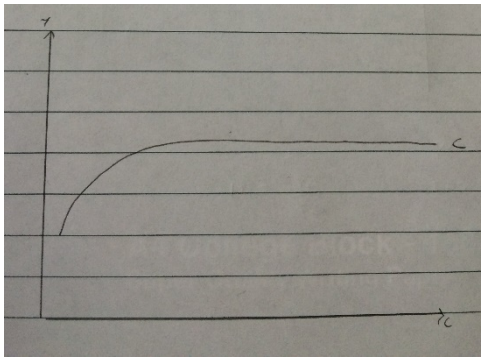
- Wealth/Ownership of assets – the most significant variable that bears a significant bearing on consumption. Whenever we feel poor, we tend to try to see how to accumulate resources to accumulate wealth by giving up some of our consumption.
- Taxation – it is one of our marginal propensities of withdrawal (mpt). If the mpt goes up, then of course the mpc has to go down. The less resources there are in terms of disposable income (they are taxed), the more is going to be the mpc.
- Distribution of income – meaning inequality. How does inequality impact on consumption and economic growth? We have a situation in the US and also spreading in other countries, whereby 25% of the GDP is enjoyed by just 0.1% of the population. Those 0.1% have the same amount of wealth as 60% of the American population. Poor people or people on average/low income tend to consume most of their resources. Your desire to consume more is there so if you get an additional euro, you will consume more, hence the multiplier will be bigger. If we have a couple of tens who

are billionaires and have additional income, they won't consume more. The higher the inequality, the lower the multiplier. The more resources are shared equally, the better it is because the multiplier will be higher. More equal distribution of income is a positive factor in economic growth.

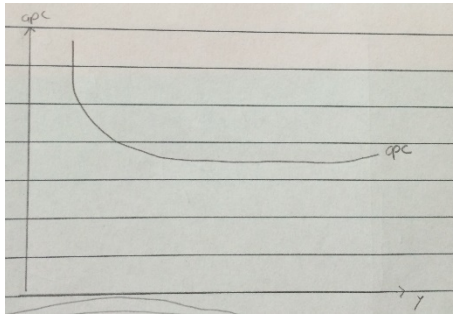
- The expectations of prices and income – if people expect inflation, of course they will consume now rather than tomorrow. What happens if people anticipate that tomorrow prices are going to be cheaper than today? People will postpone their consumption to tomorrow. This was one of the main problems that Japan had to face for 15 years (1990-2005). They had to struggle with deflation. Month after month people were expecting prices to go down. If people anticipate something to happen, they will make it happen. Producers will start reducing their prices to attract more customers. This will have a negative influence on mpc. It's the same thing with income. If you expect your income to increase, you will be tempted to buy more. If people are anticipating redundancies or are uncertain about their future, they will think twice before consuming something.
- Tastes and attitudes – we can notice a big difference between generations. The more people access credit, the more they are going to consume, and the higher the mpc. In the old days, people used to save a lot and it was only thereafter before they would consume.
- The durability of the goods that we consume (the age of durability) – light bulbs produced in the 40s and 50s had much higher lifetime than those produced today. Same applies to female tights. If the wear and tear of products is shorter, we have to consume more and companies will increase their profits. It applies as well to mobile phones. The shorter the durability, the more we will consume, and the higher the mpc will be.

3 Theories that discuss how consumption is influenced by income:

- **Permanent Income Hypothesis** – the consumption pattern that we choose is influenced by our permanent income. We do this without even knowing. It is something that we are programmed automatically to do. In your first 5-7 years of working you would have an idea of what your permanent income is going to be. If you enter a job which will earn you 35,000 and you had to remove the inflationary impact, over a lifetime that would be your constant stream of income. Without realising, you would base your decision of how much you should spend on your home on that expectation. The level of consumption is influenced by our permanent level of income.



- **Absolute Income Hypothesis** – we have the apc (average propensity to consume) which shows how much of the total income, we are consuming. The more income we have, the more we will consume. We reach a certain limit in terms of apc. When our level of income is low (10,000), we tend to consume most of that income. Our apc would be near to 100%. As income goes up, we would still increase our apc, but we will allocate more resources to savings. Ratio wise, the apc will

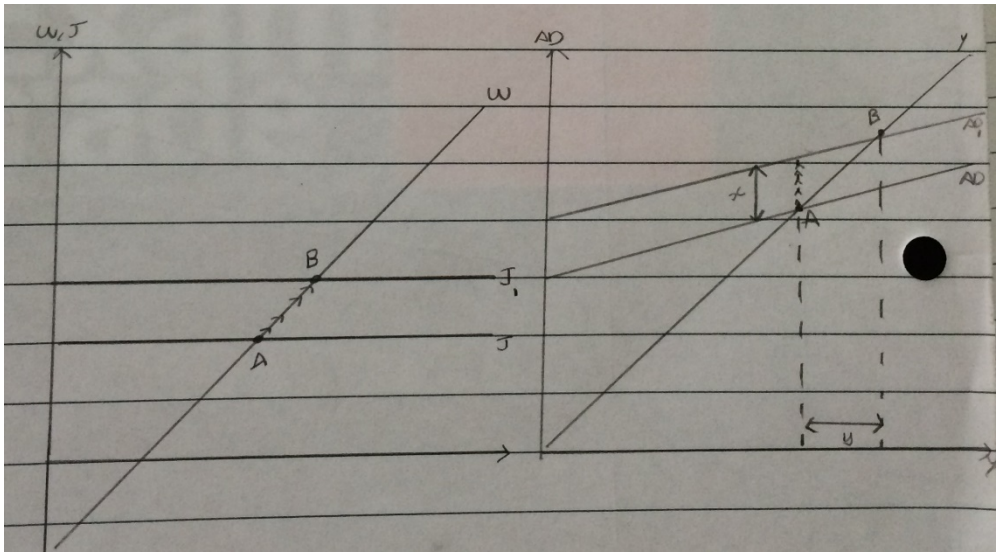


decline until it gets stable, with income. If we had to go back to the issue of inequality, this is why it matters that income is equally distributed. If more income is diverted to those who are on low/average income, they would consume more of it and higher economic growth.

- **Relative Income Hypothesis** – we tend to base our consumption decisions by observing what others are consuming. If we had to look at income inequality and consumption inequality, consumption inequality is by far less. People do not know what others have in their bank account but people do observe what others are doing and consuming. We tend to compare how we're doing with our friends, neighbours etc. We tend to base our consumption decisions, not only on income but we give a lot of importance to relativeness.

Data about Consumption:

- **Time-Series Data** – we refer to it whenever we are dealing with a particular variable and we're observing its consumption over the years. Let's say we are dealing with Malta. We have the years 2000(X1), 2001(X2) and 2002(X3) and we are recording consumption.
- **Cross-Sectional Data** – when we compare consumption data (or any other kind of data) for a number of countries/households/units, over a particular period. Let's say we are comparing Malta's, UK's and the US' consumption in the year 2000.
- **Panel Data** – when we consider data for different countries over a number of years. Basically, the panel data refers to both of the above combined.



Our economy is in equilibrium at A, where W=J (withdrawals are equal to injections). Y = C + W. On the other hand, from the Expenditure side, AD = C + J. This means that W = J (since Y = AD). Our first equilibrium is at A. There is an exogenous shock in the injections so J will increase to J1 (for example exports increase) and as a result of that, if there is more expenditure, there has to be more income as well. That is why we have a new equilibrium at B. Looking at the other diagram, AD = C + J. AD goes up, but as a result of the multiplier, if AD goes up by x, our Y goes up by y (y is greater), such that if we divide our change in income, by the change in injections, we get our multiplier.

LECTURE 4 – INVESTMENT

We're going to endogenise I in the Keynesian equation. I is going to be influenced by our Y.

I is **Investment**. It is that kind of expenditure that is related to physical capital/tangible things. Dealing with things that help us to produce other goods and services (machinery, equipment, software, buildings, etc.). Anything that is useful in the production of goods and services. Investment expenditure can either be public or private.

If we go back to Y in a closed economy in the national flow of income, Y = C + S. We can either consume it all or allocate some of our income for savings purposes. Assuming that there is no other party (foreign sector), what we save can be utilised for investment purposes. The investment will eventually give us more output so that we can enjoy more consumption. Providing that we have a closed model (no exports and imports), our S = I. The more we save, the more funds are available for investment purposes. If we have more investment, then we will have more output.

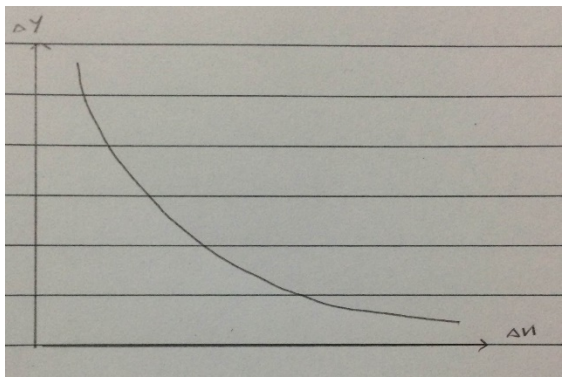
Y = f(L,K). Output is a result of **Labour Hours** and **Capital**. Capital is made up of all the tangible goods (even non-tangible such as software) that help us to produce goods and services. The capital stock (an accumulation of something at a certain point in time) is made up of the accumulation of investments. In 2015, we had about 12 billion euros of capital stock on the islands. Over the years, all the accumulated investment added up to 12 billion. In 2016, part of that capital stock will wear out. Because of depreciation (the wear and tear of machinery), part of that capital stock will be lost. That 12 billion will go down to 11.5 billion in 2016. That is our K. If GDP (Y) is a function of labour hours and capital, since our K diminished, so will our Y. If we want to make sure that there is no decrease in Y, we have to make sure that the value of K at least remains what it is. In order to replace that wear and tear, we need to invest at least 0.5 billion to replace the depreciation. This 0.5 billion is referred to as **Replacement Investment**. Over the decades capital has increased, for the simple reason that each year we add up further investment to the wear and tear. That part of investment that is over and above the replacement is considered to be **Induced Investment**. Therefore any change in capital is equal to investment. Capital is the stock and investment is the flow. We have annual flows that supplement the stock:

$$\Delta K = I$$

In the micro we used to discuss the concept of DMR and we're going to apply this concept over here because it applies to investment. DMR - When we have a lot of something, the returns from that variable tend to diminish over time. When we start to accumulate something, what we get in return starts to go down.

Marginal Efficiency of Capital

When we have a small capital stock and we just invest a little, that little investment is going to bring about a substantial increase in output. When we have a lot of capital stock, we have to invest quite a lot and that investment will only give us a little return. There is an inverse relationship between the rate of return and the amount of capital.



$$\frac{\Delta Y}{\Delta K} = \frac{\Delta Y}{I} = \frac{25}{100} = \frac{1}{4}$$

¼ : for every 1 unit of capital, we will be able to produce ¼ of a unit of output.

In general, to produce one unit of output, a developed economy requires 3 to 3.5 units of capital.

Why is the MEC important for economic growth (g) purposes?

$$g = i \times MEC$$

g is the percentage change in GDP from 1 year to another. i is the share of investment out of total national income.

Y = C + S where S = I. If we have 10euros, where we are consuming 8 and saving 2, we're saving 20% and therefore investing 20% of our income. The share of investment (i) over here is going to take a value of 20%.

What is the likely growth rate that you would expect for a poor country and an advanced country? For a poor economy you would expect to have a high growth rate. In a poor country, given that the stock of capital is low, the rate of return is going to be high and therefore our MEC in this case will be 0.5 and our growth rate will be 10%. On the other hand if we have a mature economy (0.25 MEC), our growth rate will be 5%. This helps us to understand why poor countries grow at a much faster pace relative to mature economies.

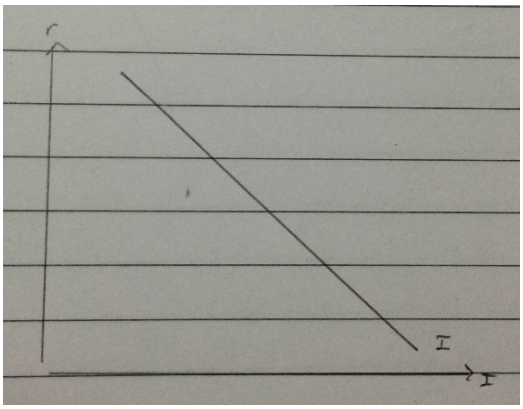
The law of DMR affects investment and therefore the bigger our stock of capital, the lower will be the returns (the increase in GDP).

Why is it that poor economies do not manage to come out of poverty? Poor countries live hand to mouth. Whatever they produce, they consume. They don't manage to produce enough to have some savings in order to produce more output. Given that they don't manage to save, they don't manage to invest. With no investment, the growth rate will be very low.

Why is it possible that the Westernised (developed) economies grow infinitely? DMR can be defied by human capital. There is no limit to knowledge. It is possible for Western economies to keep on growing because of human capital. That limit imposed by DMR is pushed further away. When you have a lot of investment, you have to invest in the right brain (innovation). If you have what it takes in terms of human capital, but you don't have enough physical capital, then the labour resource won't be that productive.

Determinants of investment (characteristics that influence investment):

- **Confidence about future Demand** – we invest in order to build a capital stock so that we can produce more output. If we know that people are uncertain, then they will be a bit more conscious how they spend their money and it is highly likely that the growth in future consumption will be low and even investment. We invest only if we know that what we're going to produce, we will manage to sell it.
- **Profitability of Businesses** – if we know that something is profitable, then we will invest in it. We invest money with the idea that from that capital that we're going to invest (in financial instruments, businesses, etc.), we're going to get a rate of return. If that is not the case, it will be stupid of us to invest.
- **Tax Regime** – if there is any form of government help, it will encourage entrepreneurs to invest more.
- **Economic Growth Rate** – important for the simple reason that if aggregate (total) demand goes up, then investment will follow. If we don't have economic growth but rather we have a recession, then of course businesses won't invest a penny.
- **Rate of interest** – the interest rate basically represents the cost of money. Money has a price as well. When you take a mortgage or a loan, you have to pay something in return to the bank. There is an inverse relationship between I (investment) and r (interest rate). There is always one central intervention rate set by the central bank and then loan interest rates, saving interest rates and all the different interest rates in the economy are packed to it. Let's assume that our r is an average interest rate. When the interest rate is high, let's say 10%, investment will be low. It is costly to borrow money. The number of opportunities that will give us a rate of return that is higher, are low. We have to make sure that we're going to have a rate of return of 11%, 12% or something higher than 10% in order to invest (make a profit). When the rate of interest is low, the investment would be much higher. The number of opportunities that will give us a rate of return that is higher, are quite a lot and therefore the demand for investment is of course higher.



Endogenising I – substituting I with other variables such that I is influenced by what happens in our Keynesian equation. Let **I = α x ΔY**; where α = ΔK / ΔY. We refer to α as the **accelerator**. This accelerator principle is different from the multiplier. The multiplier is related to consumption. Induced investment is influenced by the change in aggregate demand, meaning that if there is an increase in AD, we can only satisfy that by investing more (expanding our capital stock). The accelerator is about the required investment to bring about such change in national income. MEC and accelerator work in opposite directions. When MEC is high, the accelerator is low and v.v. The accelerator for a poor country is low. They need only little investment to generate the same amount of units of output as in a mature economy because they don't have too much of DMR.

How does the accelerator work in the equation? Let's say that the government is going to shock the economy by 10 million and therefore G will have an impact on Y. That will feed into the Y_c and the Y_i. The

two of them will feed back into the Y. We have 2 variables that are feeding again into Y. The other variable that we can endogenise is only M and we can endogenise it in a similar way as consumption.

How is investment related to the increase in Aggregate Demand:

Year	0	1	2	3	4	5	6
Output	1000	1000	2000	3000	3500	3500	3400
Machines	10	10	20	30	35	35	34
Replacement		1	1	1	1	1	0
Induced		0	10	10	5	0	0
Total		1	11	11	6	1	0

One machine has a productivity of 100 units and every year we're going to have one machine that is fully depreciated. From year 0 to year 1, demand is the same, we have to throw away one machine, so we have to invest in 1. In year 2 demand is going to increase by 1,000. We have to invest in 10 more machines and the usual 1 replacement therefore total investment is 11. Year 3 is the same (but a 50% increase in demand). In year 4 we have a positive demand but less than before. We have to buy 5 machines and the usual one therefore we have to invest in 6. In year 5 the aggregate demand is stagnate so we only invest in 1. In year 6 we have a recession and the aggregate demand is less. Therefore we don't need to invest in any new machines.

$$\Delta Y_{t+1} > \Delta Y_t \Rightarrow I \uparrow$$

$$\Delta Y_{t+1} = \Delta Y_t \Rightarrow I =$$

$$\Delta Y_{t+1} < \Delta Y_t \Rightarrow I \downarrow$$

The ΔY_t is when we're comparing yesterday's GDP to today's GDP while ΔY_{t+1} is when we're comparing today's GDP to tomorrow's GDP.

Year 1 is our Y_t and year 2 is our Y_{t+1}. Change in Y_t (0) < change in Y_{t+1} (1000) and therefore the first parameter applies (we have an increase in investment). In year 2 (1000) and year 3 (1000), the changes are equal therefore investment will remain the same. There is no increase in the absolute amount of demand. In year 3 (1000) and year 4 (500), the change diminishes and so will the investment. Same applies to the following years.

We have a situation where investment will only increase if there is an exponential increase in consumption. If there is an exponential increase in consumption, then investment will increase. The moment that consumption starts to lose steam, then investment will at first stall and then stop. If we had to go back to our Keynesian equation, when there is a shock, that shock will at first create a momentum that will stimulate investment. The moment that the multiplier will start to lose its momentum, investment will

immediately stop because investment won't feed again into income and the shock will feed in itself until the multiplier eventually wears out.

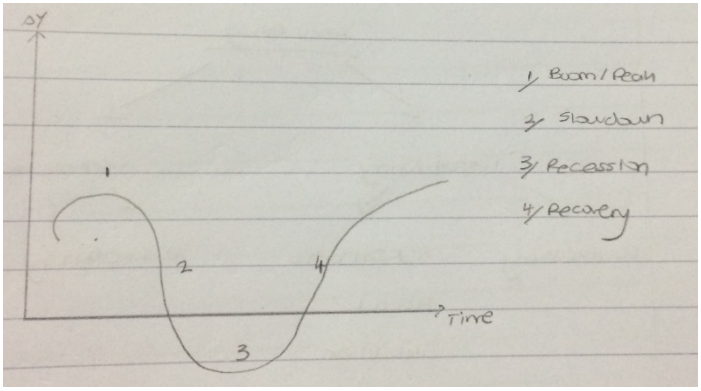
This is what influences the **Business Cycle**. When there is a business cycle and there is recovery that is taking place, the recovery will not only lift consumption but also investment. When we are at the boom, consumption will start to taper off, investment will stall, consumption will start to lose steam and investment will go down. From the boom, we will go into a slowdown which will lead to a recession. That is the business cycle. There are business cycles that take place in 5 years but in history there were even business cycles that took place in 15 years (from one recovery to the other).

LECTURE 5 – THE BUSINESS CYCLE AND GOVERNMENT

<u>The Business Cycle</u>

The more capital there is, the higher the accelerator must be because the mec (marginal efficiency of capital) is low. The more capital we have, the more we need to produce one unit of output because the law of DMR.

How is investment triggered and what is the accelerator all about? For investment to continue to increase, the percentage increase of consumption must go up exponentially. For investment to keep its momentum, we need the consumption curve to increase in an exponential way. The moment consumption starts to taper off, investment will stall and will feed into our Keynesian equation and have its consequences on the multiplier effect on consumption as well.



The business cycle reflects the change in economic growth (Y) with respect to time. The peak is when the economy is growing at its maximum. Following every boom, we start to experience a slowdown which will eventually translate into a recession and after that we start recovering.

What is the business cycle influenced by?

- **Bandwagon Effect** - we say that we are rational human beings but we are very lazy. The thinking process involves a lot of energy so we try to avoid it and we tend to base most of our decisions on what we observe – hoarding. When there is a stock market crash or a rally, there will be a handful of very bright individuals who know what is happening in the market and they start to make crucial decisions. The rest will observe and will follow. That is why it's referred to as bandwagon. If there are key players that want to get out of the market, there is a trigger and the rest will follow so there is a collapse in the price of shares. If someone is foreseeing a recession/collapse and pools out, the rest will do the same and it is like a self-fulfilling prophecy that is made real. If we're going through a slowdown, and there is panic mode, it will result in a recession. Substantially influenced by psychology factors.
- **Echo Effect** – about the durability of investment. If we buy a machine and it lasts for let's say 20 years, then there is no need for us to invest until 20 years. If machines or any other durable good wears out over a smaller span of time, then of course there is going to be more investment around and that is the echo effect.

- **Government Policy** – government can influence investment substantially through policy. Either by giving out tax credits or deduction on investments, adjusting depreciation rules and also interfere by giving certain tax allowances for certain investments (making them tax free).
- **Accelerator** – the more consumption there is, the more investment we're going to have and that investment can only be sustained by further or higher consumption rates. The problem with this is that if we tend to consume a lot and that consumption is not sustained by disposable income, but sustained by credit, in reality that is something not sustainable at all. It is what happened in the last financial crisis. People obtaining loans to buy shares. Whenever there is this consumption binge based on irrational factors, at first consumption will increase exponentially, but the moment consumption will be financed by credit, there is a collapse which will have a significant impact on investment.
- **Exogenous Economic Shocks** – it is one way of how you can destabilise an economy. If the main source of economic growth is terrorism, just make some terrorism attacks and you will destabilise the economy. Other shocks include a meltdown somewhere in a stock market.

Government

The third variable of our Keynesian Equation (G). We're going to leave it as is because it can never be endogenised. It is there to influence the economic cycle.

What is the difference between government expenditure and the government budget? The definition of G (government expenditure) is that kind of expenditure that government has to spend in order to deliver goods and services. Given that our G is part of our Y, Y is the worth of the goods and services produced. Implicitly, we're saying that G is the worth of goods and services produced by government. The difference is made up of transfer payments. The budget is made up of 3 components. We have recurrent expenditure, interest payments and capital expenditure. Government spends around 3.5 billion euros. Almost 1 billion of that money consists of transfer payments. Transfer payments consist of different types of expenditure that accrue to different segments of society for which they don't produce any form of good or service. Social benefits. Against the pension, there is no form of output. Given that there is no output, we cannot include that type of expenditure under G. G is a subset within that expenditure, but beyond that subset, there are other forms of expenditure that we have to remove from Y because the payments are not made out of some form of production of goods and services.

2 sides of government:

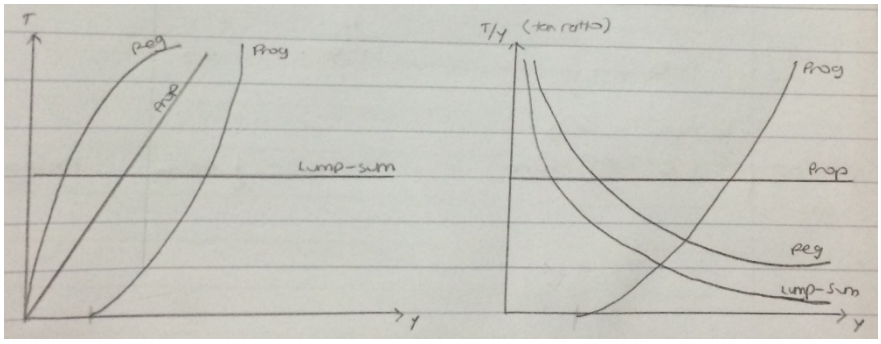
- **Expenditure**:
    - Recurrent Expenditure – that expenditure that is spent on a daily basis and finances wages and salaries, programs and initiatives (measures that are carried out on a routine basis by government such as maintenance). This is the biggest chunk of expenditure (2.5 billion). 1 billion of that 2.5 is transfer payments and the rest is GDP.
    - Interest Payments – government has been running a deficit at least for the past 33 years. For the last 33 years or so, expenditure was always higher than revenue. Given that more money goes out than comes in, government has to make up for the shortfall and issues bonds. Asks households or financial institutions to lend money to the government. Against the credit, government has to pay interest. On interest payments

we spend about 250 million on an annual basis. Equivalent to how much we spend on education and health.

    - Capital Expenditure (I) – what government spends on infrastructure, schools, health, roads, etc. That amounts to approximately 300 million.

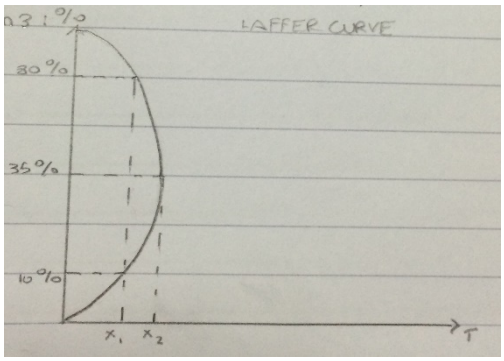
- **Taxation** (other profit includes profit generated by central bank but this is a negligible share of revenue):
    - Direct – linked to a source of income. One of the major contributors is income tax. Through income tax government generates about 900 million euros a year. There are different contributors in terms of income tax (employees, self-employed and companies). The income tax paid by employees or self-employed, there are 3 computations (single, married and parent computation). The single computation is there for single persons but also there for couples where both of them work and therefore the income is assessed at a personal level (there are tax thresholds). The married computation is there for households where there is just one breadwinner and the other partner is not in work. The parent computation is very similar to the single one. The thresholds are a bit higher and you have to be a parent of children under the age of 23 years. With respect to income tax on companies, they pay corporate tax in their profits. There are 2 rates. One for Maltese companies and there is one for foreign companies. The 2 are relative to EU rates. Owners of Maltese companies have to pay 35% tax on profits. Foreign companies have to pay 35% and receive back 30% so the effective rate is just 5%. The only thing that we have to offer is a competitive edge on taxation. Then there is social security contributions (NI). As employees we pay 10%, the employer has to pay 10% as well on behalf of the employee and self-employed people have to pay 15%. With respect to NI, there is a capping (a maximum threshold). The pensionable income is capped. If you were accustomed to live on an income of 30,000, all of a sudden you have to adjust on a pension incomes of just 12,000. That is why we have to save a lot.
    - Indirect – linked to consumption. We have customs and exiles (what we pay on fuel, half of it goes to taxation; 60% of price on alcohol and cigarettes goes to taxation). From fuel government generates about 80 million and from cigarettes about 70 million. VAT (Value Added Tax) is a tax on consumption. There we have a number of rates. The standard rate is the 18%. 7% on accommodation (hotels), and there is also a 5% rate on books, newspapers, educational material, etc. Then there is the 0 rate (tax exempted) such as food (from grocery and not from restaurant) and health services (medicine etc.) The EU wants to harmonise VAT rates (a rate across the board on all things). VAT yields government about 17 million euros a year. Other sources include fines, licences, etc.

4 types of Taxation:

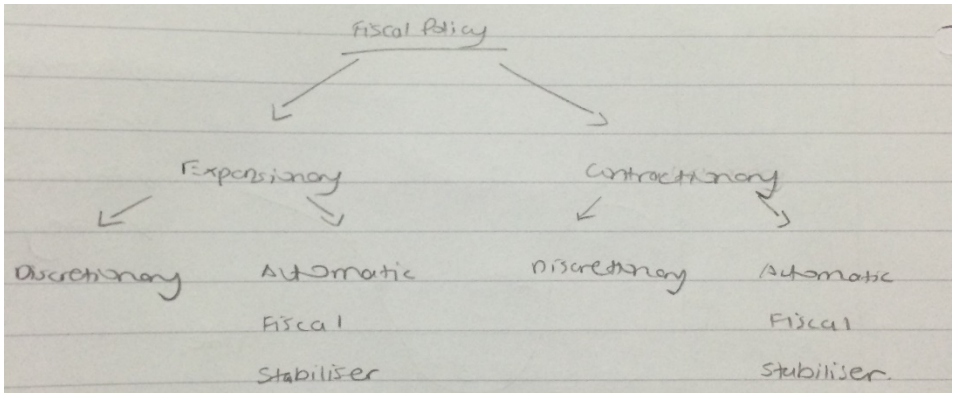


- **Progressive** – it doesn't start from origin because the first part of income is non-taxable but then the higher the income is, the more tax is paid on that income. An example is income tax. The more income, the more tax we have to pay.
- **Proportional** – implies a flat rate and irrespective of your level of income, you have to pay a particular tax. There are certain states where they have this taxation whether it is for NI, income tax, VAT, etc. Those who are poor are given tax credits. Everyone has to pay 15% irrespective of income, and the government will give the poor a refund.
- **Regressive** – although it goes up with income, it starts to bend. The more you earn, eventually the less or rather in proportional terms the less you're going to pay. An example would be customs and exiles and VAT such ad exiles on cigarettes. The amount of tax paid is the same, but as a proportion of income, there is a huge difference.
- **Lump-sum** – perfectly horizontal. An example is the poll tax. A poll tax is a tax on every individual. Just for the sake that you're alive you have to pay a tax. The less your income is, the higher the tax rate is. The rate declines substantially when considering the tax-income ratio.

The **Laffer Curve** is about the optimal tax rate that a country should have. Income tax rate on the wealthy. If you impose a high tax rate, then the likely tax revenue that government is going to get out of it is equivalent to that of imposing a low tax rate. There we have a tax revenue equal to x1. The optimal tax rate is somewhere in between because a more moderate tax rate will not discourage tax payers so much. A moderate tax rate is more losable.



2 main policies – Fiscal Policy (owned by government) and Monetary Policy (run by the central bank).



Fiscal Policy – owned by government. It is one of government's tool, actually it is the major tool used by government to influence the business cycle. When economy is passing through a slowdown or a recession, the government can make use of expansionary fiscal policy. Expansionary meaning government can either increase expenditure, reduce taxation or a bit of both. Basically used to influence the business cycle in a positive way. Contractionary is the opposite of expansionary. When the economy is overheating because of a lot of consumption and investment and a lot of irrational decision, in order to keep the economy in check, government can decide to implement contractionary fiscal policy. Either by reducing expenditure or increasing taxation or a bit of both. Discretionary is when the initiative/measure implemented whether expansionary or contractionary is decided upon the discretion of the minister. The parliament decides that the economy needs a boost or we need to charge a particular tax to slow down the economy. It is a measure implemented through parliament legislation (a decision). The automatic fiscal stabiliser is something that triggers automatically depending on the economic cycle. An example that applies to both expansionary and contractionary. Taxation and unemployment benefit. When the economy is growing through a slowdown, people start to lose their jobs, they won't pay any tax so a certain amount of withdrawals stops from the economy. Because of the loss in income, people start to receive unemployment benefits (replaces wage income). Withdrawals stop and there are some injections. The same thing applies but in the other way round when there is an expansion. People will start to move from unemployment into employment. The injection with respect to unemployment benefits stop and instead people will start paying tax on their income (income tax or social security) as a form of withdrawal.

The **Balanced Budget Multiplier**: (falls under fiscal policy)

- Expenditure: $\frac{1}{1-b}$; $b = mpc$
- Taxation: $\frac{b}{1-b}$

Why is it that the numerator of expenditure is not 1 but is the mpc? Y= C + S. If government is going to give us 100 euros back (more income), we're going to spend part of it on consumption and the rest we're going to save it. If government is going to lower taxes, we're going to consume part of it. We're going to spend only that part equivalent to the mpc and the rest we will automatically save it. Let's assume that the mpc is 0.8. Expenditure = 5 and Taxation = 4. If government had to spend 10 euros, all that 10 euros is going to go through the multiplier but on the other hand, if government had to give 10 euros in the form of tax reductions, not all of that 10 euros is going to be consumed but just 8 and therefore the multiplier is going to be less. Why do we refer to this as the budget balance multiplier? Let's assume that we have 400 million under expenditure and taxation is equal to 400 million as well so the balance is 0. Government would like to stimulate the economy but at the same time would like to keep the budget at balance. Government is going to increase expenditure by 10 million and at the same time in order to keep this balance 0, government is going to increase tax by 10 million. How is that going to stimulate the economy is the budget remains balance? The expenditure multiplier is 5 so the multiplier effect on spending 10 million is 50 million. If the government is going to tax 10 million more, the multiplier effect is going to be – 40 million. From a fiscal point of view, government is putting in 10 and taking out 10. But from an economic point of view, because of the difference in the multipliers, when a government spends 10 it represents an injection of 50 million and when government received 10 it represents a withdrawal

of 40 million. Because of the difference in multipliers, the economy is going to enjoy a stimulus of 10 million.

LECTURE 6 – MONEY

The multiplier with respect to expenditure is bigger than that with respect to taxation. With respect to taxation, the numerator is not one, but the mpc.

The **Deficit** is an annual flow and is basically defined as the shortfall that arises whenever government expenditure exceeds government revenue. Conversely, if revenue exceeds expenditure, the government incurs a surplus. With respect to the deficit within the European framework, the Maastricht criteria (threshold) states that the deficit cannot be bigger than 3% of the GDP. It can be bigger, but then the commission will initiate excessive deficit procedure. In Malta we had deficits for the past 30 years.

The national **Debt** is considered to be a stock (while deficit is a flow). The national debt is made up of the accumulation of annual deficits. If government spends 12 euros but receives 10, then the deficit is 2. Somehow that 2 must be financed from somewhere. Government issues bonds by the central bank and these are bought by either households or financial institutions. Those bonds are accumulated to the national debt. As long as, as a country we keep on running a deficit, the national debt will continue to increase. The Maastricht criteria is 60% of the GDP with respect to national debt.

How is it possible for the national debt ratio to decrease, when national debt is going up in terms of absolute amounts? It is possible to make the debt burden more sustainable, ratio-wise, if GDP grows at a much faster pace compared to the national debt. If we have a situation whereby GDP increases at a faster pace relative to the national debt, then the burden will be spread out over a larger chunk of output. The burden will start to shrink in this scenario. The moment that the economy slows down, and the national debt starts to outpace GDP, then in that case, the debt burden would start to grow again and may even become unsustainable.

$$Debt\ Burden = \frac{Debt}{GDP} \times 100\%$$

Why is a high and persistent deficit considered to be undesirable for the economy? A high deficit may lead to crowding out. In an economy, we have the public and the private sector. If the government starts to spend much more then it generates in revenue, this money will have to come from somewhere. What happens is, that government starts to issue a lot of debt (bonds). This generates some problems:

- The government will absorb all the savings that are available and it will only leave just a few to the private sector.
- The private sector will have to compete with government for that money. If government is paying 5%, the private sector will have to pay more and therefore the private sector will incur unnecessary costs.
- The government is perhaps the most inefficient institution in an economy. If government is running a high deficit, then it means that a significant amount of resources are wasted and therefore that hinders economic growth. Instead of putting money at good use through the private sector, money is wasted on government expenditure.

- Persistent high deficits may lead to inflation (an increase in the price level of gods and services). If government is spending a lot of money, there is a lot of money going round the economy, and we have a situation where there is a lot of money that is chasing after few goods.
- Whenever there are high deficits, other deficits are created in the economy. Another deficit that takes place is related to the current account (on one hand we have exports and on the other we have imports). When government starts to spend a lot of money, people will start to import more. More money starts to leave the country rather than money coming in (twin deficits).

If we had to group all this, what are the main impacts on the economy? The economy starts to suffer in terms of competitiveness. Deficits may lead to the erosion of competitiveness. A lot of government spending may lead to the loss of competitivity. That is the private sector would struggle to compete against other foreign competitors. That is why fiscal prudence is very important (sustainable debt and a small deficit because the excess can ruin the economy).

Money

Monetary Policy – an important tool in macroeconomics. Whereas fiscal policy is ministered by government, the monetary policy is ministered by the central bank. Monetary policy is something which is more for long-term purposes.

The **Central Bank** – an important institution within every modern economy. Each central bank, is designed in a different way and has different reemits. Central banks in principle, have 2 form of independence. They have economic goal independence and political independence. The degree of independence may differ from one country to another:

- **Economic Goal Independence** – the ECB has the task to make sure that the inflation rate remains in the whereabouts of 2%. In the US, the Federal Reserve has 3 goals not one. Take control of inflation, make sure that there is a low and stable unemployment rate and make sure that there is economic growth. In the US, the Federal Reserve has to juggle with more goals rather than just one.
- **Political Independence** – in the US, the chairman of the FED is nominated by the President and has to be approved by the other branches of the executive (senate and congress). In Europe, the governor of the ECB is chosen by the heads of government. The prime ministers of each member state have to agree on who's going to lead the ECB. In Malta, the governors of the MCB are always appointed by the government of the day.

Main responsibilities of the central bank:

- A central bank is responsible for the printing of money. They can print as much money as they would like to (but there are implications). To print money is very cheap, the paper costs just mils. At the end of the day, the value of a 50 euro note arises because of the signature of the governor and our belief that the paper is worth 50 euro. The moment that our belief is no longer there, the currency will lose its value.
- The setting of interest rates. The interest rate is one of the main policy tools under monetary policy because there are many options under this policy and playing around with interest rates is one of them. There is one interest rate and it is referred to as the **Central Intervention Rate**. Linked with this rate, there are 100s of interest rates (credit or deposit interest rates). If banks would like to borrow from the central bank, they have to pay the central intervention rate. It sets

the ceiling of the cost of money. Then banks have to peg about it. It is like a benchmark against which the banks will adjust their interest rates.

- Another reemit of the central banks, is the management of reserves. It is like having a piggy bank, where all foreign exchange goes into. If we need to buy something from America we pay them in dollars so the commercial banks get the foreign exchange from the central bank.

These 3 tasks where part of the reemit of our central bank up till 2008 when we have joined the euro system. When we became part of the euro zone, these 3 reemits had to be given up and they were transferred to the ECB (European Central Bank).

What other reemits fall under our central bank?

- It is responsible from monitoring the banks. Banking activity is monitored by the MCB (Malta Central Bank). The central bank makes sure that banks are liquid enough and just in case any bank faces a liquidity problem, the central bank would step in, in order to prevent the bank from going under. In case of a bank run, the central bank will back the bank and make sure that there is enough liquidity to satisfy the withdrawals.
- Another reemit is that of issuing government debt and also responsible from its management.

Money is something quite recent in history. Prior to the existence of money, ancient civilisations still had some form of primitive trade (economic activities) but instead of using money, they used to barter. Between bartering and money, people used to trade by making use of metals (bronze, then silver then gold). Thereafter, people came up with money.

What is so special about money? Characteristics and attributes that make money so important in our economic system:

- Money is so important because it is a medium that is acceptable by everyone.
- Durable. In ancient times people used to measure their wealth by the amount of sheep or cows they used to have. However, animal stock can perish overnight if something happens (drought or lack of food). It's not the same thing with money. It does not rot and perish, it is durable.
- Convenience. Money is very convenient for many reasons. We have the highest circulation in Europe with respect to 500 euro notes. Half of the money in circulation is made up of 500 euro notes. Why is it that we have such a high presence of 500 euro notes in our economy? Because we have a lot of black market activity. In order to carry one million euros in 500 euro notes, it just weighs about 1 kilo. The euro is very convenient because it is very easy for people to trade. It is light weight and can go underground very easily. We do not have to trade in cows or in sheep which is much more difficult, but we just open our wallets and either hand in cash or plastic money.
- Divisibility. We have different denominations.
- Uniform/standard. One problem with metals is that there were people who used to cheat by fusing other metals with gold.
- It is difficult for people to produce. Paper money bears water marks, holograms, a lot of security features that cannot be easily reproduced.
- Stability of value. Although there is the problem of inflation, money is quite stable in value. Money retains its value even though there is inflation.

Because of these characteristics, it is possible for money to fulfil the following 4 functions:

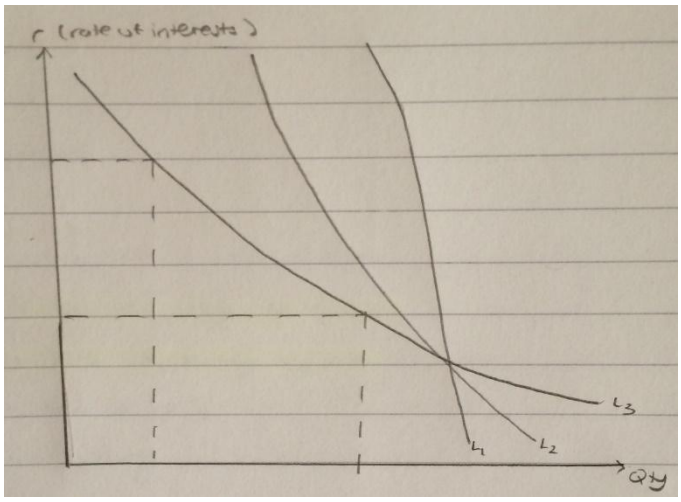
- It is a medium of exchange.
- It is a means of how we can store wealth.
- It is a means of evaluation. When you turn up at a bank, they look at the credit worthiness of a person. If you have a good bank account, you are a customer. If you don't have anything, then you're just one of the many.
- It is a means to establish the value of future claims. It is possible to spell out how much a person will owe the bank each month, and what the claim is against in terms of interest rates and capital and what is the total payment. If the rates of interest go up, the whole thing will have to be revised and adjusted.

Central banks tend to look at money in terms of M0, M1, M2 and M3. The definitions differ from one country to another. The parameters tend to change. Broadly speaking we have 3 terms:

- **Narrow Money (M0)** – also referred to as the monetary base. It consists of currency in circulation (notes and coins) and money deposits of commercial banks held by the central bank. They have an account with the central bank and they have money deposited in it. It is about liquid money that can be used instantaneously. Money in savings or current accounts (you just go at an ATM and withdraw the money).
- **Quasi Money (M1,M2)** – refers to term deposits. M1 usually refers to term deposits that have a maturity of 3 months (you deposit something which cannot be withdrawn before 3 months). M2 is 3 months+ but less than 2 years. We have to include narrow money in this definition. It is the term deposits + the narrow money.
- **Broad Money (M3)** – include everything which has a maturity that is beyond 2 years + the previous definitions.

Liquidity is always more scarce as we go down the definitions. You can withdraw it but against a penalty, a charge or giving up part of the capital.

<u>The Demand for Money</u>

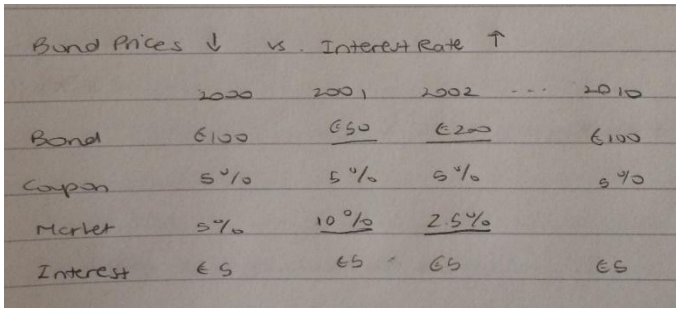


R = rate of interest. L = liquidity preference. Qty = money demand (quantity of cash).

- **Transaction** (L1) – highly inelastic meaning that the liquidity preference with respect to L1 is not that much responsive to the change in interest rates. L1 is about the transaction motive. On a

daily basis we need to buy goods and services (fuel, bread, milk, etc.) We have to pay in cash or using our credit card. Irrespective of how we pay, we need an amount of cash so that on a monthly basis we pay our bills. We need a sum of money to carry on from one month to the next. Therefore irrespective of the rate of interest, whether it is 2 or 15, we still need that amount of money to finance our consumption. That is why L1 is so inelastic.

- **Precaution** (L2) – it is about precautionary motive. It is relatively inelastic but not as much as L1. There are people who can afford to keep money aside for a rainy day. You have a savings account and you keep some money in it just in case something happens. It is less inelastic, because if there is a good opportunity (bonds with a higher interest), you will decide to withdraw that amount and invest it. SILC (Survey of Income and Living Conditions). Transactionary and precautionary motives are considered to be active balances. We tend to make use of them frequently or every now and then.
- **Speculation** (L3) – it is about asset holding. In order to understand what the speculation motive is all about, we have to discuss the relationship between bonds and the interest rate. Bond prices are inversely related to the rate of interest. When one goes up, the other one will go down and v.v. In our example, the coupon rate is fixed and government will keep on paying 5 euros until 2010. Something may happen and we want to divest so we need to sell. If we decide to sell our investment in 2001, are we going to get back our 100? If we keep on holding the investment until 2010, we will surely get our 100. It depends on the market interest rate. If in 2001, the market interest rate goes up from 5 to 10, the market is paying twice as much as in the year 2000 but the government will still pay the 5 euros because it is fixed. In 2001, we cannot expect to find someone who's rational who will give us 100 for our bond. Whoever is going to buy it will just get a 5%. Why should someone give us his 100 euros, when he can invest it elsewhere where the coupon rate is 10%? Therefore, we have to discount our bond price such that the interest payment as a percentage of the bond price, is equal to the market interest rate. We have to make sure that the rate of return that the new bondholder is going to get is equal to the 10%.



Bond Prices ↓ vs. Interest Rate ↑

	2000	2001	2002	...	2010
Bond	€100	€50	€200		€100
Coupon	5%	5%	5%		5%
Market	5%	10%	2.5%		
Interest	€5	€5	€5		€5

$$New\ Bond\ Price = \frac{Coupon\ Rate\ \times Original\ Bond\ Price}{Current\ Market\ Rate} = \frac{5\ \times 100}{10} = 50$$

We can only manage to sell that bond if we price it at 50 euros. A 5 euro return on 50 is equal to 10%. The bondholder, is going to lose 50 euros (half of his capital) because of the high interest rate. The price of the bond goes up to 200 when interest rate is 2.5%. We have an asset that is giving 5%, when the market is giving half of that. Given that we have something more rewarding, it appreciates in value. What are the implications of all this? If we get into the market in 2001, we buy the bond at 50, but at maturity we will get 100. If we go in when the bond price is 50, in addition to the coupon payment, we benefit from capital gains. If we go into the market in 2002, we stand to lose half of our capital. We buy the bond for 200, but government will only pay 100. How is this related to the diagram? When the rate of interest is high, the demand for money is

low, whereas when the rate of interest is low, the demand for money is high. When interest rate is high, bond prices are low. If interest rate is high, we get our cash out of the bank account and we buy bonds (invest the money) so demand for liquidity is low. We buy bonds because we get them at a discount. When the rate of interest is low, we have a lot of cash available in our accounts. People keep money in their accounts, because when the interest rate declines, the price of bonds goes up and they are too expensive therefore people stay away from bond market and don't invest (keep their money in their account and wait for a turnaround in the market).

LECTURE 7 – MONETARY POLICY

The transactionary motive of money is quite inelastic to the rate of interest. Precautionary motive is also inelastic but not as much as the transactionary one. The speculation motive is very elastic to the rate of interest. If the rate of interest goes up, then the price of the bond will go the other way (inversely proportional). Why? We have to offer a discount on the price of the bond so that the prevailing market interest rate multiplied by the bond price will give an interest payment that can be matched by the market. If government issues a bond at a coupon rate of 5% on 100 (5 euros). If the market rate goes up from 5 to 10%. Now government is not going to change the coupon rate so it's the price of the bond that will have to give in. The bond price will go down to 50 so that when you multiply the 10% with 50, you will end up with 5 euro (matching the market rate).

Monetary Policy – how the central bank influences the economy.

The **Money Multiplier** – how by means of credit that is by creating more money, that money can lead to economic growth.

The Direct Transmission of Money onto Economic Growth – how an increase in money supply (credit creation) will lead to an increase in money demand. This will lead to an increase in GDP and eventually this will lead to an increase in aggregate Demand.

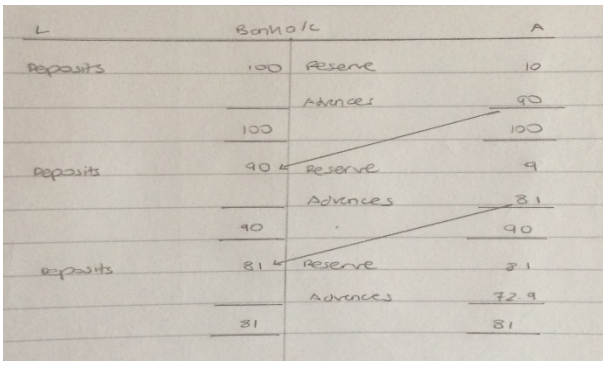
Government can make use of fiscal policy to increase aggregate demand (expansionary or contractionary) and therefore stimulate the economy.

We're going to see how the creation of money and having the presence of more money in the economy leads to economic growth. There are certain characteristics that we have to keep in mind because creating too much money can lead to certain repercussions.

Monetary Policy prescriptions:

- Credit Creation.
- Printing of Money.
- Playing around with Interest Rates.

<u>Commercial Banks/Credit Creation</u>



If we deposit money, that is an asset for us, but a liability for the bank. The bank will try to realise some form of profit over that deposit. The bank will pay 2% to the saver, but the bank will try to issue loans by making use of that deposit, and if the save receives 2%, loans are issued at 5%. The 3% difference is the profit margin for the bank. Banks function thanks to our savings. In order to make sure that the bank is liquid. Because we need money for transactionary and precautionary purposes, we may want to withdraw some money, so the bank must make sure that not all of our deposits are loaned out. The bank needs to make sure that there is enough liquidity so that if people turn up to cash their money, they are able to do so. By law, banks are obliged by the central bank to keep part of that deposit. The reserve ratio is what banks have to keep in the form of cash. It is the portion/share out of the deposit that must remain in the form of cash. It is also known as the liquidity ratio (10%). The bank can make use of the rest for loan purposes. Someone else turns up at the bank and wants a loan of 90. The transaction happens, the buyer takes the mortgage and the buyer takes the 90. The seller will eventually turn up back at the bank with the 90. We are assuming that there are no leakages. Those 90 that were advances, are now transformed into deposits. Again, the bank will have to keep 10% of that in the form of reserves, and it can once again offer 90% of that deposit in the form of loans. The story will keep on repeating itself until the amount of advances that we have is exhausted and it gets down to 0. It is similar to what happens in the consumption multiplier (same concept but with a different meaning).

How much money would have been created by this process? What is the money multiplier?

$$M = \frac{1}{L}\ ; L = Liquidity\ Ratio.$$

In this case, M = 10. Those 100 euros deposited will have an impact equivalent to 1000 euros in the economy. We can buy the equivalent of 1000 euros with just 100 euro notes. Why? There are a 100 notes, and because money goes round, thanks to the 100 euros we manage to purchase 1000 euros worth of goods and services thanks to the money of the money multiplier.

It was very alarming when banks decided that they were not willing, no matter how small it was, to give out any credit. You turn up at the bank and ask for a loan, and the banks reject your proposition. The implications are very serious. If money stops going round, the whole economy would collapse because of this credit creation. The moment that credit creation stops, the whole economy would stop to function. In our example, we are consuming 10 times as much as there is money around. The moment that credit creation stops, people would stop their consumption by 10 times as much. Ultimately, we have 1000 euros in the form of deposits, and banks have 100 euros in the form of reserves. The money multiplier explains why credit creation is so important.

How can commercial banks have their arm twisted by the central bank in order to control money supply? The answer rests on the reserve ratio. Through the reserve ratio (which is set by the central bank), the central bank can control money supply (the amount of credit available by the economy). How? The central banks can order banks to keep a reserve of 30 or 40%. The implications of such a high ratio, will be that in terms of loans, banks are able to give less. The money multiplier will not be 10, but just 2.5. Now there is less credit that is going around. By tweaking this reserve ratio, the central bank can force commercial banks to give less credit. If the central bank decides that the reserve ratio has to go down, that means that the credit ratio is going to go up, GDP goes up and so will aggregate demand.

Printing/Injection of Money

Quantitative Easing – printing as much money as you can. The central bank has the power to print money. Really and truly there is no limit to how much money can be printed. The only limit is how much the machines can print. Central banks are using this because they have run out of ammunition. Interest rates are 0 and the liquidity ratios are at historical lows. Governments are almost bankrupt (have accumulated high debts) and therefore fiscal policy are out of use. It is the last policy prescription that the central bank can utilise. The world economy is getting used to this prescription. We always want more.

What is the purpose of using this policy tool? The reason behind all this is that there is not enough money going round. If we give more money to people and money is cheaper, people will consume more. Recall that one of the determinants of consumption is wealth. How does this influence wealth? The moment central banks inject more money in the economy, the price of financial instrument (stock markets) has surged tremendously. The price of shares has gone up tremendously because people are making use of that money to invest. It's an issue of supply and demand. If there are 100 shares and there are a lot of money coming in, the price of those shares will go up. It's what's happening in Malta with respect to bond prices. The idea is that if people feel more wealth, which is an illusion in a way, because we're inflating assets by an illusion created by more money going round. The idea is to inflate asset prices, if people experience an increase in their balance sheet, you will consume more because you're feeling wealthier.

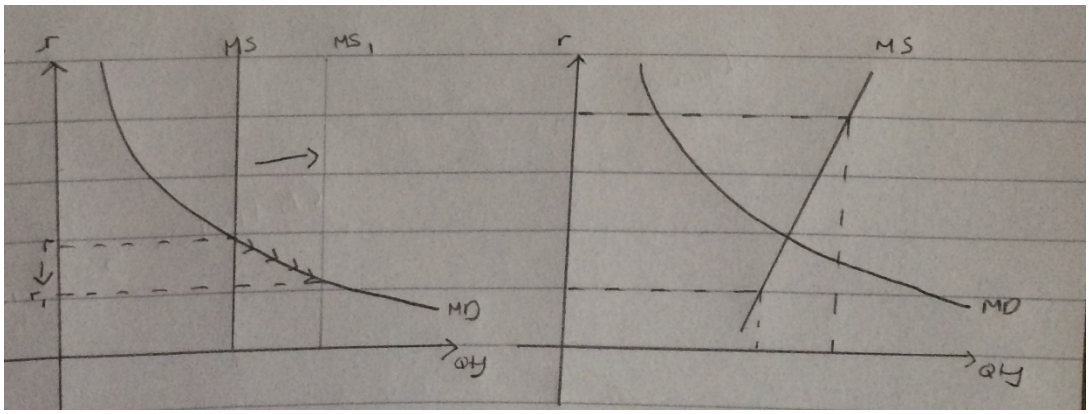
What is the means? How does the process get done?

- Central banks print more money but how does this money find itself out there? How is it leaked into the system? They do it by buying government debt. The central banks print out stock piles of money and start offering bondholders a generous price to buy that government debt. That is how the cash find itself in our accounts. The central bank now owes the money to the central bank rather than the bondholder. Government can run deficits forever and that deficit is being financed by the central bank. It's like free money. Usually, when the economy is doing well, the result of all this would be inflation.
- Another means, which is very similar to the one above, is when the government deficit is financed by commercial banks so the government takes a loan from commercial banks. What happens? They have an asset (the government stock), and they can lend against it and that is how credit creation takes place. The loan is given to government. The central bank can add another stimulus to monetary supply apart from the multiplier and commercial banks together with the central bank can further expand this by the commercial banks selling out the loan to the central bank so they don't have anymore advances so they have a further deposit against which there is going to be no claim. The advance is given to government, so if we leave it as is, we have the credit creation as in the diagram above. We can expand this strength. The commercial banks have the advance, and against the advance they must keep some reserves etc. But the commercial banks can generate more money if they take the advances out, sell it to the central bank and they get paid for it (they get money because they have sold an asset). The central bank adds further money to the balance sheet. Whenever they sell that asset, they have more money for the deposits.

How is monetary policy not effective? It is not effective if government borrows directly from us (households). If government had to borrow money from us, it is just an issue of displacement of money. If we're going to give money to government as a loan, instead of us spending the money, it will be the

government spending it on behalf of us. Instead, of us consuming, it is going to be the government consuming so the credit transaction is not effective as the former tool and therefore the government loan won't work.

Interest Rates



Looking at money supply by looking at interest rates (the third monetary policy prescription).

We have 2 scenarios:

- One where money supply is exogenously determined.
- The right hand side is where the money supply is endogenously determined.

Exogenous is when the variable is not influenced by what happens in the model but is only effected by foreign factors.

Endogenous is when the variable, in this case money supply, is influenced by one of the other variable in our model, which in this case is the rate of interest (r).

RHS: the money supply is responsive to the rate of interest. When the rate of interest is low, banks are willing to supply a few amount of money and v.v. The higher is the rate of return on money (the higher the profit that banks can realise), the more banks are willing to lend (directly proportional). This explains why money supply is endogenous in this case.

LHS: money supply is perfectly inelastic. If we would like to influence the interest rate by for example expanding (moving the monetary supply to the right to reduce the rate of interest). The rate of interest goes down from r to r1.

What are the factors that will lead to a change in the money supply curve (rate of interest)?

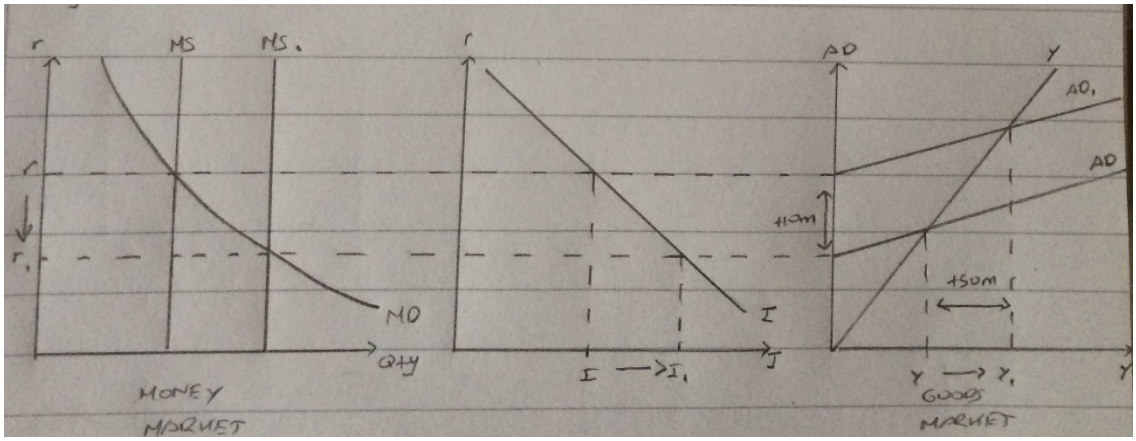
- Money supply can shift outwards if we have quantitative easing. The central bank can also decide to print less money, or decide to sell instead of buying government debt (the money supply will shift inwards and interest rates will rise). The central bank will be absorbing money from our accounts and therefore there is less liquidity going around.
- Liquidity ratio can also effect this both ways.
- External shocks. Example: exports. We are exporting a lot, more tourists are coming in. They come in with their money and are going to spend it. That money is going to remain in our economy and it is somehow going to enter our banks. Money supply will shift outwards. Likewise, if we export

less, we have to get money from our accounts and we shift it abroad (there is less money going round in our economy).

In reality, money supply is endogenously or exogenously effected according to the type of economy.

<u>The Indirect Transmission of Monetary Supply and its effect on GDP.</u>

Money supply and money demand – following how the monetary policy eventually leads to economic expansion. How the central bank can influence the economy.

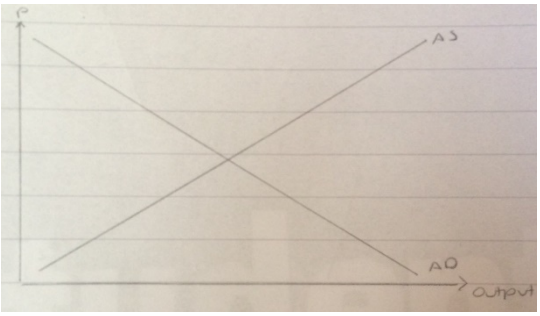


In the money market, we have an exogenous money supply. The central bank is going to take action (printing of money, reserve ratio). The central bank will make sure that money supply is going to shift outwards from MS to MS1. As a result of that shift. MS > MD, r will go down and given now that it is less expensive to borrow money, entrepreneurs have the incentive to borrow more. As a result of that reduction in interest rates, money is less expensive to get hold of. Whenever there is a lot of something, the good or service of the price is cheaper (here we are dealing with money). As a result of the rate of interest going down, I (investment) will go up, our AD will go up (AD = C + J(I,X,J)). I is endogenised since it is influenced by the rate of interest so as we have seen earlier on, we have C and I that are endogenised so AD goes up. At the end of the day, the increase in our GDP would be even greater than the increase in AD because of the multiplier. If the multiplier is 5 and the increase in AD is 10m, then the increase in GDP is 50m.

We have a combination of monetary policy tools (printing more money having a direct impact on interest rates). This is one side of the story, meaning that over here we have seen how by printing more money and playing around with the money supply, we can influence GDP.

Next time we're going to look at a scenario where if we play around with money supply, the only results that we're going to get is pure inflation and no increase in the GDP. Arguing what is happening over here (circumstances are very different).

LECTURE 8 – AGGREGATE DEMAND AND SUPPLY



P = general price level (average price charged for all goods and services produced in the economy). Instead of quantity now we have output.

AD = C + J (J = X, I , G).

AS = f (T, L, K); T = Technology, L=Labour, K = Capital.

Reasons for a downward sloping AD curve:

- **Income Effect** – if we experience inflation (an increase in the general price level), that is going to lower our consumption and given that consumption is part of our AD, we're going to move upwards along the AD curve.
- **Substitution Effect** – if we experience inflation, then it is highly likely that we opt for imports at the expense for locally produced goods (C will go down and M will go up). On the other hand, if what we export is going to be more expensive, foreign consumers will opt for something else and instead of purchasing our goods, they will substitute us by looking at goods from other countries. Therefore X will decrease and so will the AD.
- If we have inflation, interest rates will go up and we will end up paying more to service our credit facilities. If we have a mortgage, credit card, etc., we will end up paying more on them. If the rate of interest goes up, investment is negatively related to it and therefore this will have a negative impact on investment (it is more expensive to borrow). Given that I is part of our equation, we will also have less AD.

Reasons for an upward sloping AS curve:

- **Diminishing Marginal Returns** – when we are running at almost full potential (making full use of the available labour and capital), the more expensive it is because we get less return from the inputs we're putting in. Therefore, the more we produce, the more expensive it is.
- **Scarcity** – when things become scarce, of course they are more expensive and therefore the more we produce, the more is the utilisation of certain resources, hence we start to experience scarcity.

Reasons for movement along the AD curve (staying on the same curve but tend to observe different points):

- **Consumption** - if there is inflation, we're going to consume less. If prices go up, we're going to move upwards/leftwards along the AD curve.
- **Investment** – if the general price level goes down, we have deflation, and then of course the central bank will have to reduce the rate of interest to stimulate the economy. If that is the case, then of course it will be more appropriate to invest because investment is less costly to undertake.

- **Exports** – it is all about price competitiveness. If we manage to offer more for less, we move along the AD curve. If the price of a holiday in Malta is lowered by 10%, then there is going to be more demand by tourists to spend some time over here.

Reasons for movement along the AS curve:

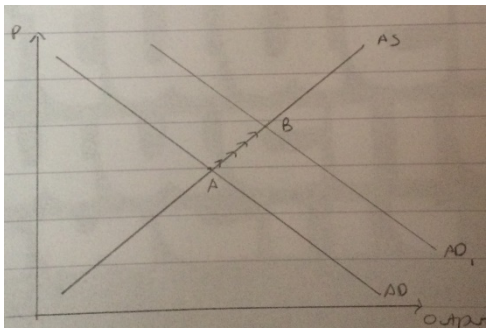
- **Labour** – the higher is the wage rate (this will have an influence on the general price level), the more workers we're going to have.
- **Capital** – the more units of capital we have, the more units of output we're going to produce.

Reasons for shifts along the AD curve:

- **Consumption** – disposable income, wealth, etc. shift consumption curve and of course the AD curve.
- **Government** – referring to fiscal policy in principle. If we have an expansionary fiscal policy (either lower taxation or else higher expenditure or a bit of both), the government is going to inject more money into the economy and the AD curve will shift outwards/rightwards. If the government decides to implement contractionary fiscal policy (either an increase in taxation or else a decrease in expenditure or the 2 prescriptions at the same time), then the AD curve will shift inwards/leftwards.
- **Exports** – the issue is exchange rates (the price of a currency in terms of another currency). If we have depreciation (when our currency is less expensive in terms of other currencies – it loses its value), the price of the products are going to be less and we can export more which will lead to a shift outwards. If the value of a currency appreciates (the value of the currency becomes more expensive in terms of other currencies), the AD curve shifts inwards.
- **Investment** – the bandwagon effect, the accelerator, government incentives given to employers to take more investment, etc. shift investment curve and of course the AD curve.

Reasons for shifts along the AS curve:

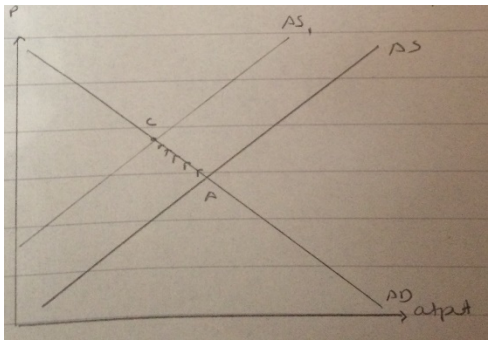
- **Technology** – we can produce double the amount by improving technology. The AS curve will shift outwards because for the same price we can produce more.
- **Labour** – if there is an improvement in terms of demography, or an increase in migration, those are factors that contribute positively to the AS. An aging population has an opposite effect i.e. the more old people there are in a population, the less people there are available for the work force and the AS starts to shift inwards.
- **Capital** – in a way it is also linked to technology. Out of the same unit of capital, we manage to get more output. It is the result of advances in technology which leads to better performance of capital.



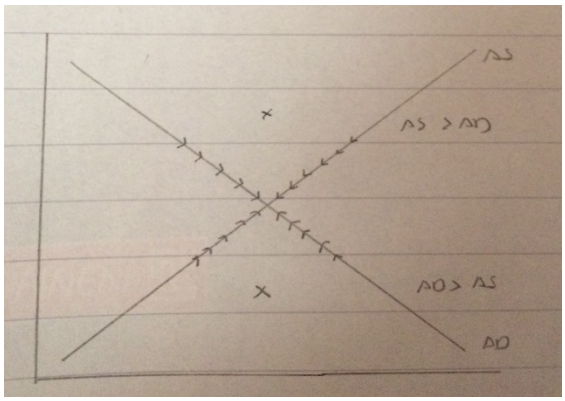
Example 1: There is an expansionary fiscal policy. How will that influence our diagram? If there is more demand for goods and services as a result of more government expenditure or less taxation, more people will get into employment or else people will work longer hours to supply those goods and

services. Therefore that leads to an upward movement along the AS curve.

Example 2: Let's assume that there's an inflationary environment and unions are going to bargain for higher wages. How will higher wages impact on the diagram? Although there will be more people who are willing to work, an increase in the wage bill will lead to higher costs and therefore less demand for labour from employers. Employees are willing to work more but it doesn't mean that employers are willing to take up more employers. The AS curve will shift inwards because employers will demand less labour. In the form of input, if we double the minimum wage, employers will try to substitute labour with another factor input (capital). We also notice a movement along the AD curve. This is because if employers are going to demand less labour, they will pay less wages and it means that there is going to be less disposable income. If we have lower AD, we have the income and substitution effect so we move leftwards along the AD curve.



What happens if AS > AD (disequilibrium state)? There is a surplus of goods and services compared to the amount of money that is available to purchase them. If this is the case, then there must be some form of deflationary pressure to get rid of that surplus. The goods and services at the disequilibrium are highly priced and in order to get rid of the disequilibrium, of course producers will produce less but in order to get rid of that excess inventory, there must be some form of deflationary pressure (prices are reduced so that the inventory is consumed).



On the other hand if there is a shortage (AD > AS), there is more demand than there actually is goods and services available and therefore there must be some form of inflationary pressure. If there is inflation, employers will be encouraged to produce more, and on the contrary aggregate demand will retreat.

<u>Aggregate Supply Curve with respect to the short-run and long-run</u>

The Quantity Theory of Money

In order to purchase the amount of GDP produced, we need less notes because there is the circulation of money. Let's say GDP is 10 euros and we have 2 euros in terms of coins. That 2 euros will have to circulate the economy at least 5 times in order to purchase that 10 euros worth of goods and services.

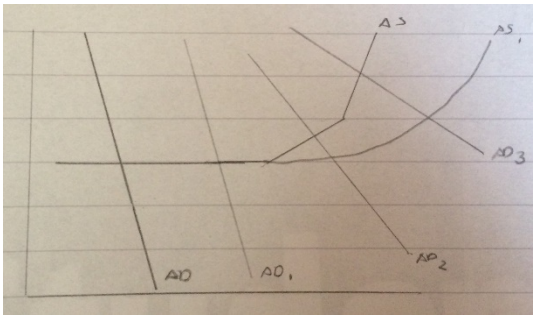
$$M.V = P.Q$$

- M (money supply) – the money that we have at hand.
- V (velocity of money – the number of times that the currency exchanges hands.
- P (general price level) – stands for inflation.
- Q (real GDP) – it is about the volume (quantity).

Let's assume that we have no control over the velocity of money and therefore we are assuming that V is fixed (we can't influence it). In the short-run, to a certain extent, even Q is fixed. There is a limit to how

much we can increase volume. Therefore we're left with M and P. In the short-run, if we increase money supply, there's going to be an increase in the general price level (pure inflation).

Because there is a lot of spare capacity, the fiscal/monetary stimulus, will increase AD but it won't have any effect on the price level. This is because there is a lot of under-utilisation. Given that we have the under-utilisation of resources, then of course the inflation rate will remain stable. If we keep on pushing with stimulus, we may arrive at a point where additional stimulus will lead to further economic growth but at the same time there will be some inflation as well (AD2). If we keep on persisting with additional stimulus, what will happen is that we will only get pure inflation without any economic growth (AD3).



Basically there is a limit to **demand-side policies**. Demand-side policies are policies that influence positively aggregate demand. They can either be fiscal or monetary policies. Anything that boosts aggregate demand is considered to be a demand-side policy. These kind of prescriptions usually apply for short-term purposes (a quick fix). The best example is 2008 when the economies where collapsing and there was a concentrated effort on demand-side policies (interest rates, expansionary fiscal policy, printing of money, lower liquidity ratios, etc.). All attempts were being implemented at once.

How are we going to achieve additional output in the long-run without triggering inflation? At the same time it must be sustainable and perpetual. For sure, demand-side policies are not the way to go. In order to extend AS to the right without triggering inflation, there is the need of **supply-side policies** (AS1). Those type of policies that make it more tough for people to remain dependant on social benefits (pushing more people into the work-force). Another way of how AS can be increased is through the improvement of human capital. This is all about the skills of the working force. We can increase it even by working less (it is possible if there are higher levels of human capital). Earning much more for less hours of work. AS can be extended to the right through human capital (being more productive and smart). AS can be further extended through government incentives that promote investment. Investment and technology are very inter-linked. The more investment there is, the more likely it is that technology improves. If we have better technology, then our capital becomes more efficient and therefore we can get more output out of it.

Persisting with demand-side policies even in the long-run. They will not only lead to higher inflation but also to the accumulation of debt and higher deficits. It doesn't work out to employ perpetual expansionary fiscal policy. If we want to achieve sustained economic growth, we have to keep on extending AS (having more skilled labour and improved technology).

Summary of the quantity theory of money – assuming that the velocity of money and the real GDP are fixed (and they are in the short-run), the only thing you will get if you keep on increasing money supply, is pure inflation.

<u>Unemployment</u>

Unemployment – all about individuals who are looking for work. Someone who is not actively looking for work, is classified as inactive. Inactive people (sitting at home not looking for a job) are not considered as unemployed.

With respect to unemployment, there are 2 yardsticks. The public employment service register (ETC) have a register whereby they keep record of those people who are looking for work via the **public employment service agency**. The official way of how the EU compares unemployment across the member states is the **labour force survey** (carried out by the NSO). In this survey they have a sample (300 households) and ask 2 questions. Whether the person was actively looking for employment 15 days before the survey and if the person replies yes, then they move on to the second questions which is something about if you are offered a job opportunity, are you willing to accept it? If the person says yes then the person is considered unemployed but if he says no, he is considered inactive.

$$Unemployment\ Rate = \frac{Unemployed}{Labour\ Supply\ (unemployed + employed)}$$

There can never be a country in the world which has 0% unemployment.

Different types of unemployment:

- **Frictional** – the least unemployment you can have is made up of those who are frictionally unemployed. It is made up of individuals who are in transition from one job to another or else from education into employment. It is quite natural that for most university students, they will experience some form of unemployment the moment they finish education (a couple of weeks/months until they enter a job).
- **Seasonal** – it is linked to seasons (particular periods of the year). In other island states especially in the pacific, they have little unemployment during the summer but they have quite high rates during the shoulder or winter months. In the summer they have a huge amount of tourists but in the winter months, tourism dries up and there is no need for all those employees.
- **Cyclical** – demand deficient unemployment. The type of unemployment that takes place during a recession. The demand for labour is a derived demand. If there is demand for goods and services, there is demand for work, but if there is no such demand, people are made redundant. This aspect of the cyclicality is linked to the performance of the economy. When there is a recession, the unemployment rate will go up and when there is a recovery it will go down. When cyclical unemployment is on a long-term basis, people will become structurally unemployed.
- **Structural** – when there is no demand for the skills of a particular person (you are out of fashion). What you are able to sell has no demand in the market. It is also influenced by geographical mobility (people are not willing to move elsewhere to find a job). Most of the time structural unemployment can only be addressed by giving training (improving human capital).

LECTURE 9 - INFLATION

We're going to see how NSO calculates inflation.

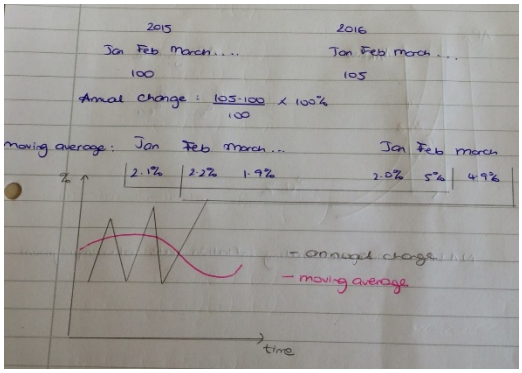
What is Inflation?

Inflation is defined as the general and persistent increase in the price level.

The way the national statistics office (NSO) calculates inflation is quite complex and laborious. To calculate inflation, you need to know what people consume. Every 5 or 6 years, NSO carries out the household budget survey (HBS) through a random sample of 4000 households which is stratified (different income groups) and the households are randomly selected. For 2 weeks, each member of the household of all the households selected must keep track of everything that is consumed and the expenditure incurred. They must keep track of VAT receipts as proof of their payments. They must also include details of quantities of products, the volume of products and from where they bought it. Example: 2 packets of 1kg of pasta and the name of the shop from where it was bought. They do it because they want to know what households are consuming and from where they buy the products. It is important because when the price of a product goes up, different shops price that product differently. NSO keeps track of the weight of the sample. They give statistical amounts to different retail outlets. Different products are bought from different outlets. So when the NSO collect information, they keep record of prices and the quantities bought from the different outlets.

Inflation is about the general increase in price level. If the price remains the same but the volume of a product goes down, (ex 800g of pasta instead of 1kg, but the price remains the same) that must be taken note of, because the customer is getting less in terms of volume so it is inflation in a way. There are different inflation rates for different products for example for fish and fruit. The prices of fruit and fish are different during the year. Hence they calculate an amount for that product. Index –keeps track of inflation rate.

Annual change and Moving Average



Annual change - difference between 2 years expressed as a percentage to calculate inflation.

Moving average - takes an average of the past 12 observations from each month and there we get an inflation rate. In the month of March, we calculate the inflation rate and the 12-month moving average moves, in

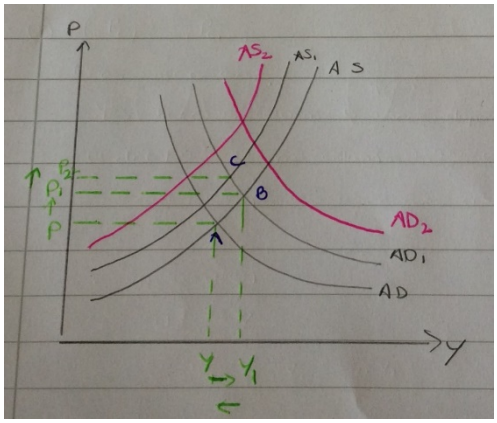
that each month we take the average of the past 12 months. They do this because it is less noisy, meaning there are less seasonal effects. Moving average is more flowing i.e. averages out the spikes in the inflation rate.

The ministry announces the **cost of living adjustment**, which is in respect to the cost that workers have to pay for inflation and it makes up for the erosion of the purchasing power. The compensation for the previous year. The cost of living adjustment is important because it has legal implications. Moving average indicates the cost of living adjustment and there are many legal documents which stipulate how much the maintenance has to be in accordance with cost of living. Ex: rent subject to adjustment of the cost of living and maintenance of spouses in divorce and separation.

We have 2 yard sticks to calculate inflation:

- **Retail price index** - tracks changes in the cost of a fixed basket of goods over time. It is the one that is used for local purposes.
- **Harmonised index of consumer prices** - the yardstick used by the European commission to calculate inflation across the member states. The benchmark that the ECB tries to achieve in the general price level is 2%.

The difference between the two is that the harmonised index of consumer prices gives a bigger weight to hotels and restaurants. So the difference is in weighting. Moreover, they are very similar i.e. the two inflation rates move in tender.



<u>Demand Pull and Cost Push Inflation</u>

We have a situation where there is an increase in the general price level which is a result of a shift in aggregate demand (AD1).

What may lead to that shift in AD?

- An increase in government expenditure. Expansionary Fiscal Policy may lead to **Demand Pull Inflation**. Demand pull inflation is about a lot of money chasing too few goods. If you have a limited amount of goods and there are a lot of people chasing those goods, there will be an increase in the price of those goods. There is not enough output to capture that money.
- Printing a lot of money (quantitative easing). It will trigger further consumption. If there is no inflation, wages will not increase, things will start to get cheaper and people will postpone their consumption decisions. Hence lower AD and unemployment will follow. Inflation is desirable at least with a low figure of 2%. For economic growth there must be a low level of inflation rate, or else it would cause a disaster in the economy.

- Exchange rate. If there is a change in exchange rate, (depreciation) when we import goods they are more expensive and if we import more goods, then of course, because of depreciation, those goods are going to increase the inflation rate.

Demand pull inflation will increase the cost on customers. Unions ask for a compensation and workers are getting the compensation. This will feed into an increase in prices which will result in cost-push inflation. AS curve shifts inwards to the left (AS1) and as a result prices go up again. But output reverts to its original position (Y1 back to Y from B to C). We moved from equilibrium A to B and then to C. Each time there is an inflationary impact, but the GDP goes back to its original position.

There are other reasons that leads to **Cost Push Inflation**:

- Increase in the price of raw materials.
- Certain natural disasters may limit the production of goods.
- Taxation - if government imposes tax on certain products.
- Increase in interest rates - central bank may increase interest rates to reduce inflation. Interest rates may lead to inflation from a cost push perspective, there will be additional prices. The drop in investment outweighs this effect.

If we would like to stretch that argument, government can stimulate the economy and a new expansionary measure may lead to a new AD curve, a further push to the right (AD2). But then were back to square one. More inflation will lead the unions to ask for more compensation. We're going to have a new shift in the AS curve to the left and we have cost push inflation. If we have demand pull inflation were going to have cost push inflation and this process will repeat itself - **Wage Price Spiral** (we have increase in prices followed by an increase in wages, and hence prices are going up again).

<u>Why is high inflation considered as undesirable?</u>

High inflation can <u>erode the price competitiveness</u> of a county. Hence high inflation is undesirable. If you have to compensate the workers, not according to their productivity but according to the increase in prices, that will be unsustainable. Business will no longer be competitive. If wages are not backed by more output, then you are going to be forced out of the market.

Apart from that, inflation can also <u>erode the business sentiment</u>. If there is high inflation, the business may be unwilling to invest. When inflation is high, it does not pay to set up a business, because no one will want to trade with you, and you will be out of business.

It is also <u>costly</u> if inflation is high. Businesses would have to change their pricing structures which is costly in itself.

The best way is to have a minimum inflation rate between 2-3%. No inflation or high inflation rate are both undesirable.

Inflation can be addressed through fiscal policy or monetary policy:

- If we have a lot of demand pull inflation, then the government will implement fiscal contractionary policy by cutting down on expenditure. Fiscal policy that addresses AD.
- From the monetary aspect, the central bank can increase the liquidity ratio. If liquidity ratio is increased, banks are obliged to keep the money. There will be less cash/credit chasing the output and therefore there will be fewer purchases and AD will taper out (there will be less money supply and hence people won't be able to consume that much).

If interest rates go up, AD will shift inwards (Inverse relation between investment and interest rates.)

<u>Unemployment and inflation</u>

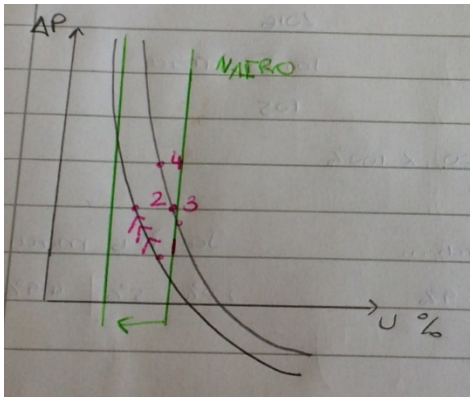
Phillips curve

Short term and long run.

Short term – **Phillips curve** is about the trade-off that exists between unemployment (rate of unemployment) and inflation (change in the price level). There is an inverse relation between the two. When we have deflation, unemployment continues to increase.

Why is it that there is a trade-off between unemployment and inflation? (there is an economic rationale behind it)

On the right side of the graph, there is high unemployment. If unemployment is high, wages do not increase by that much because there is idle capacity and there will not be pressure on capacity. If wages do not increase, prices will not increase.



On the left hand side of the graph, when unemployment is low, we have an opposite scenario. More bargaining power to ask for higher wage. When the economy is running at its full potential, resources are becoming scarce. All inputs especially labour will increase. If wages go up, so will prices.

The curve can be expressed in the form of an equation

$$\Delta P = \frac{1}{U} + P_e \qquad \ddot{P}_{e_t} = \ddot{P}_{e_{t-1}} \text{ ; } P_e\text{– Price expectations}$$

Today's price expectations are influenced by yesterday's price expectations.

There is psychological behaviour in the economy. If we observe that the economy is going good, we tend to go along with the crowd. Not based on rational behaviour, but we follow others. Today's inflation expectations are based on past experience. This is the specification that we have with respect to inflation.

We're going to see the impact of fiscal policy and what are the repercussions. We have a certain level of unemployment and inflation. The government is not happy and there is expansionary policy which leads to demand pull inflation, and GDP shifts outwards. Demand for labour is a derived demand, increase in labour demand and lower rate of unemployment. Expansionary fiscal policy is going to lead to a demand pull inflation (move from 1 to 2 on graph). Demand pull inflation leads to an increase in GDP. That increase in real GDP will increase the demand for labour, and as a result unemployment will go down.

Unions are not going to be happy about that and they will ask for compensation – cost push inflation. Because of cost push inflation and because people will believe that inflation is going to remain high, we're going to have a shift in the Phillip's curve such that the inflation rate will remain at the same level, but unemployment will go back to where it was originally. Inflation rate will hold ground because of cost push inflation and it will contract real GDP. We have less real GDP and less demand for labour so unemployment goes to where it was originally.

Government is not happy once again, so there is another expansionary policy, from 3 to 4 and we can keep on going like this. End result is that if government keeps implementing expansionary measures, it will result in higher inflation and unemployment will remain stuck in its original position i.e. will get a vertical line, an ever high rate of inflation. We refer to this as **NAIRO (Non-Accelerating Inflation Rate of Unemployment)**.

In the short run, we're going to have the same rate of unemployment and a different rate of inflation rate. In the short run, we can move from 1 to 2.

How can the government reduce unemployment without triggering inflation? Push the NAIRO to the left. A full employment situation without triggering inflation. All those who are willing to work are in the labour market. **Supply-side policies**.

Demand-side policies will only lead to inflation, whether through fiscal or monetary. However it can only work in the short run and if there is idle capacity. Supply side policies can reduce unemployment without triggering inflation.

Supply-side policies – making it more difficult for people to remain on social benefits (and give nothing in return), introduce benefits for employers to take on employees, introduce training measures, invest more etc.

<u>The balance of Payments</u>

We're going to look at the external side. Balance of payments is like any other form of account. It is like a trial balance, where every country keeps track of what is happening and its trading positions with other countries. Basically it is an account where statistical institutes keep track of the annual flows and transactions related to trade and monetary transactions. It has a debit and credit side. Credit side represents an inflow - money is flowing into the economy. Debit side represents an outflow - payment.

The balance of payments is made up of three accounts:

- **Current account** - it has other subdivisions within it, mainly there are 3. One about goods, services and transfer & income:
    - Goods – we export and import goods (merchandise trade). We have a debit balance (left balance) of €-1.5 billion, we import more than we export. Imports exceed exports by 1.5billion. We make up for that through services.
    - Services – credit balance of €2.1billion. We export more than we import with regards to services.
    - Transfers & income – refer to 3 things. Credit balance €0.2billion, more money coming in rather than going out.
        - Wages – foreign workers working here transfer wages abroad.
        - Companies – foreign companies transfer part of their profits abroad.
        - Government transfer - EU money and bilateral aid of money.

    Overall there is a credit balance of €0.9billion. It went into a credit balance during the last few years thanks to i-gaming which generated a lot of profit.

- **Capital account** - acquisition of fixed assets. Whenever foreigners purchase from abroad, that constitutes a capital transaction. Can work both ways, we buy form abroad and foreigners buy from here. Credit balance of €0.15billion. Money is coming in.
- **Financial account** - deals with transactions relating to money, portfolio investment etc. it is about the money market. Whenever someone invests money abroad, or foreigners invest their money here in financial instruments. Debit balance of €0.8billion which left the economy.

Similar to the trial balance, there is the **suspense account**. It includes sort of a balancing item. Ultimately the debit and credit side have to be equal. In the balance of payments we have a suspense account that keeps track of the errors and omissions. In terms of errors and omissions, NSO cannot be aware of all transactions. Last year there were more than 110million on the debit side, which means there were 110million worth of transactions that the authorities are not aware about. Every country keeps a piggy bank, which keeps the foreign exchange. Whenever we buy things from abroad we have to pay with their currency so we use the reserve to deposit that foreign currency in the central bank. Whenever we pay foreigners, we go to the central bank to obtain the foreign exchange. Reserves – piggy bank, surplus form the balance of payment. Money will go in the piggy bank. When there is deficit from the balance of payments, less money will be in the reserves. As a country, compared to other countries, we have a big margin in terms of errors and omissions because there is a lot of activity which is not recorded. If we import 10million from Italy, Italy will have 10 million export to Malta, and if records do not tally there will be an error.

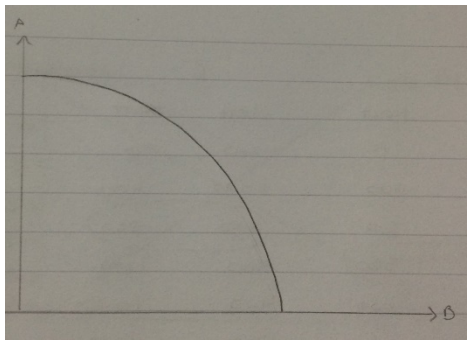
LECTURE 10 – COMPARATIVE AND ABSOLUTE ADVANTAGE

The advantages of trade. Discussing the theory, numerical examples that illustrate the advantages of trade.

It pays for countries to specialise in the production of goods and services and therefore makes sense to trade with goods that they specialise in.

Absolute Advantage - we're going to assume that we have 2 countries A and B and these 2 countries can produce the same set of goods. Both of them have the same availability of inputs. The only difference is that one country is able to produce, out of those inputs, more units of output relative to the other country. For every good or service, one country can produce more output relative to the other country assuming that both have the same amount of inputs.

Production possibility frontier – a country can produce good A and good B and that frontier illustrates the trade-off between these goods. This country can decide to dedicate all of its resources and none to B and the other way round (everything focused on B and nothing on A). In between there is the trade-off i.e. resources are shifted from A to B. In our example, every country has the ability to shift resources from A to B. The only difference between the 2 countries is that when they are shifting resources from one good to another, one of the countries will have a lower opportunity cost (it is about how much you're going to give up with respect to something in order to do something else) with respect to the other country. Which of the 2 countries have the lowest opportunity cost with respect to production of that particular good? The country with the lowest opportunity cost benefits from a **Comparative Advantage.**



Our 2 countries can produce wheat and meat:

	Wheat	Meat
A	2	1
B	4	8

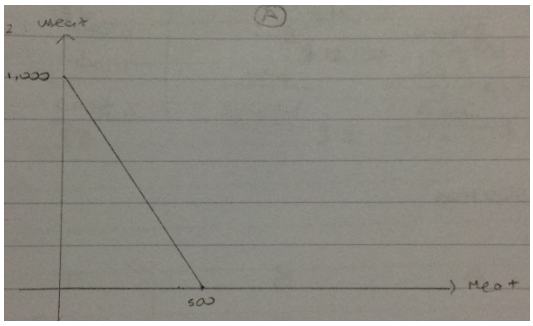
B has the benefit of Absolute Advantage with respect to both wheat and meat. B is able to produce more wheat and also meat when compared to the other country.

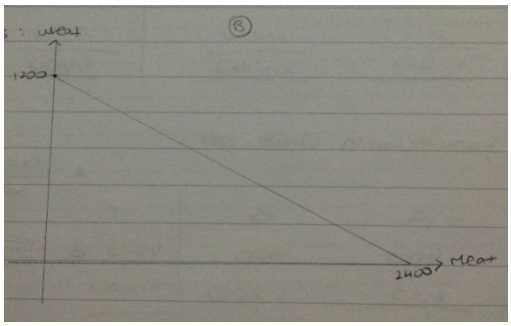
Comparative Advantage – we have to assess the opportunity cost and therefore look at the ratios i.e. how much company A is going to give up in order to get the other and v.v.

- Wheat – if A had to focus its resources on wheat, if the resources are diverted from meat to wheat, for every one unit of meat that is lost (from A), A can produce 2 units of wheat. On the other hand, in B, for every 2 units of meat that it will give up, it will only produce 1 unit of wheat. Therefore it is A who is best in producing wheat. For every 1 that they transfer, they manage to produce 2. It pays A to produce wheat. They have a lower opportunity cost relative to B. In terms of comparative advantage with respect to wheat, it is A that enjoys this advantage. We have (2 : 1 for A and 1 : 2 for B). A are better off in producing wheat so their production decision is to focus their resources on the production of wheat.
- Meat – if A had to produce meat for the same resources, they will get just 1 and B will get 2. So basically A must focus on wheat whereas B must focus on meat. The application of the law of comparative advantage implies that if these countries want to be better off, A must specialise on wheat whereas B must specialise on meat.

Why does it pay to specialise and to trade?

The production possibility frontier will tell us the 2 extremes with respect to A and B. We're going to have 2 extreme points and the distance between them represents how much that particular country can produce.





In the table we have the possibilities that we observe along the curves (the plotting points):

A		B	
Wheat	Meat	Wheat	Meat
1000	0	1200	0
800	100	1000	400
600	200	800	800
400	300	600	1200
200	400	400	1600
0	500	200	2000
		0	2400

Prior to specialisation we observe the options that country A is producing 400 and 300 while country B is producing 800 and 800 (they want to benefit from the consumption of both goods). Producing roughly equal amounts in order to benefit from both goods.

Before Specialisation:

	A	B	Total
Wheat	400	800	1200
Meat	300	800	1100
	700	1600	2300

Now our 2 countries are going to specialise (A in wheat and B in meat). The total amount of goods produced increases significantly from 2300 to 3400. The issue over here is that A are just getting wheat and B are just getting meat. Now they will have to trade. In order to trade, we're going to assume that the price of wheat is equivalent to the price of meat (1 : 1 in terms of prices).

Specialisation:

	A	B	Total
Wheat	1000	0	1000
Meat	0	2400	2400
	1000	2400	3400

Whereas A was consuming 700 units before, now they are consuming 1000, whereas B were consuming 1600 and now they are consuming 2400. After specialisation and following trade, the welfare of these 2 countries will improve.

After specialisation (Trade-off – A exports 600 units of wheat to B and in return B exports 600 units of meat to A):

	A	B	Total
Wheat	400	600	1000
Meat	600	1800	2400
	1000	2400	3400

Irrespective of the combinations that I choose, both countries in total are going to be better off, for the simple reason that after specialisation, everyone is going to produce more units of output. Thanks to specialisation, we have 1100 extra units of output (3400 – 2300). These would not have been possible without specialisation. Being the jack of all trades does not pay. It is better if countries specialise in what they are best because that will give them the ability to export the surplus and in exchange of that they consume more of something else.

Why do at times, countries prefer to restrict trade?

- The argument in favour of the protection of infant industries – one way of how these can survive is by protecting the industries. There are several ways of protecting the industry:
    - Imposing tariffs (imposing levies which is an additional cost/tax on the price of imported goods). At the same time, part of the revenue generated from tariffs can be given to

industries as the form of a subsidy (the firm gets money such that the good can be exported for less). Using the tariff in order to penalise the imported good and compensate Maltese entrepreneur to export goods. Tariffs can be used to increases taxation and use some of the money to even subsidise the Maltese goods.

  - Government gives a licence/permit to someone to import quota. You restrict the sum of imports to restrict the competition from the local goods.
  - Licences can also be used to give the permission to only a handful of people to import something. You restrict the number of people who can import something and therefore they can be easily controlled to how much they can import.
  - Barriers – prohibit the importation of certain goods.
  - Another way to how trade can be limited is by imposing exchange rate controls. In the past, we used to deal with the Maltese lira. In order to trade, business people had to obtain foreign cash so they had to exchange the Maltese lira to foreign cash if there is a limit to how much you can exchange, then implicitly you are saying that there is a limit to how much you can import.

  All these things limit the amount of imports that can flow into the country and therefore protect the infant industries. The country that is engaged in trade becomes dependant on other countries for the consumption of certain goods. Author key (when a country relies completely on its resources for its consumption and production).
- Reliance on trade.
- Trade may attract big corporations which interfere with politics. They are so big and they generate much tax revenue so they may become more powerful than the government itself.
- Trade may also lead to dependency risks.
- Countries can use trade to keep other countries at a developing stage. In Europe we produce a lot of food. We don't trade the food but just dump it in Africa. You can never compete against something that is given for free. We have the surplus and we give it for free so at the receiving end, you can never compete (abusive trade).

<u>Benefits of trade within the EU</u>

Whenever there is a customs union (the EU – the countries themselves within the union are engaged in free trade so between themselves there is a free market – no tariffs), the countries together have common tariffs for countries that are outside the group. A customs union leads to 2 things:

- Trade Creation – it is about shifting production from a high cost producer to a low cost producer (the benefit of trade). If there is someone in the market who can produce something of same quality for less, then it makes sense to shift trade to there. In that way everyone is better off.
- Trade Diversion – before we've joined the EU we used to import sugar from the US because they produce it at a very low price. Once we became part of the club, because of the tariffs, it was more convenient (cheaper) even though sugar went up in price, it was cheaper to buy it from the union rather than from US (the club imposes tariffs on sugar imported from the US). Shifting the consumption of something from a low cost produce to a high cost producer.

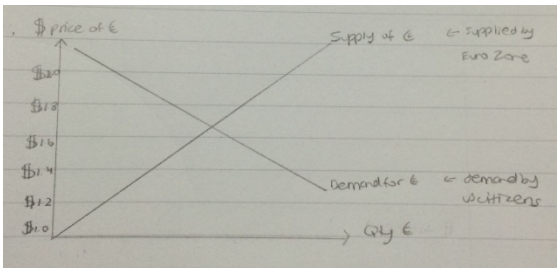
Exchange Rates

Focusing on depreciation and appreciation.

When we discuss exchange rates, we are discussing about currency markets. Discuss the price of a currency in terms of other currencies.

How much does a euro cost in terms of dollars? (there is a market for currencies)

What is the meaning of the supply curve of euro? It is upward sloping because if we are supplying euros and we can get hold of more dollars, then we are willing to supply more euros. The more we're getting for our euro, the more we are willing to supply.



What is the meaning of the demand curve of euro? Now we are US citizens and in our pockets we have dollars. If we have to give up 2 dollars to get hold of 1 euro, then we're going to demand a low amount of euros. If we had to give up just 1 dollar for 1 euro, then we're going to demand more euros. If the euro is cheaper (We have to give up less dollar in order to buy it), we are going to demand a lot of it.

Exchange Rates	US	EU
	$6	€4
$3 for €1	€2	$12
$2 for €1	€3	$8

We're going to trade a particular good (its price in the US is 6 dollars and in the EU it is 4 euros). We are Europeans and we are going to buy the good from the US. How much will it cost us? We're going to pay 2 euro with the current exchange rate.

The exchange rate is going to change.

Reasoning this with respect to the balance of payment (with respect to the exports and imports). The change from 12 to 8 dollars (focusing on Europe). How will it impact the balance of payments? It will impact the current account (dealing with trade). What will happen in terms of exports and imports and why? The price of the good is still 4 euro (it won't change). Initially, the US citizens had to pay 12 dollars for it but now they can get it for just 8 dollars. Because now the dollar (and not the euro) price of the same good is cheaper, and therefore Europe will export more and the US will import more.

Let's have a look at imports for the EU citizens. Initially, we were paying for this good in euro terms 2 euros (in dollars it will remain 6). Because of the change, the euro price goes up from 2 to 3. It is more expensive for us therefore we're going to import less, so the US will have to export less (our purchases is their sales).

Appreciation – the dollar now is stronger (more valuable). It is so, because whereas before we had to pay 3 to get 1, now we only pay 2 to get 1. The value of that 2 is bigger than the previous value of the 3. When I give you less in return of something, it means that the dollar with respect to the euro, has appreciated.

Depreciation – the euro has depreciated with respect to the dollar in our example.

Europe: If there is depreciation in Europe, how will that impact on the current account? Let's say that we have a surplus in the current account, what will happen to it? The surplus will increase. If euro is going to depreciate, we will export more, import less and that surplus will improve. If we have a deficit, it either shrinks or else it goes into surplus.

US: What happens to the American current account if the dollar appreciates? Let's assume that they have a surplus. It will decrease or else it will go into a deficit. If they have a deficit, they will simply have a bigger one.

LECTURE 11

Appreciation and depreciation impact on exports and imports.

The 3 regimes that deal with exchange rates:

- Fixed-Rate (Devaluation/Revaluation) – a system where one currency is pegged to another (it is anchored against another currency). Most of the time, these countries tend to peg (fix) their currency rate against the dollar. Eg: Argentina with their pezos. They tend to fix their currencies for the following advantages:
    - Providing some form of assurance (stability) against volatility. Traders know beforehand how much the exchange is going to be and that gives some form of certainty.
    - There is no room for speculation. The big assumption we're using is that the country is being managed as it should (there are sound policies). If there is mismanagement, it is highly likely that speculation takes place.
    - A fixed exchange rate is like a straight jacket which binds the government of that country to behave in a responsible way. In order to be successful, these rates require good governance (behave in a fiscal, responsible way). Expansionary fiscal policy will have an impact on Y and if C is endogenous, that expansionary fiscal policy, will also influence consumption. Assuming that also imports are endogenous, because of the expansionary fiscal policy, consumers are going to buy more goods. If government spends more money, that stimulus will also impact the current account. If there is an excessive current account deficit (import more than export), we're going to run out of foreign exchange (money), then that is a big problem (a clear indication that a country is living beyond its means). Therefore if governments are irresponsible, they will lead to such problems. If there is a fixed rate, the government will think twice about the policy measures that it adopts.

  Disadvantages:
    - Impose certain limits on either fiscal or monetary policy. Why? If the central bank would like to fire fight inflation, then the central bank will increase interest rates but if these go up, and that particular country is more attractive to foreign investors to deposit their money, what will happen is that the particular currency will appreciate (requires intervention from central bank). When the exchange rate is fixed, the effect of these policies is significantly diluted for the simple reason that the biggest concern of the government will be the external balance (if the country runs out of foreign exchange, it will be a significant challenge). The fixed regime limits the intervention of fiscal and monetary policy.
    - If there is a current account deficit, this will persist because the exchange rate is fixed. If we have a current account deficit, in such a scenario we would expect the currency to depreciate (importing more than we are exporting). If it is fixed, that won't happen therefore the deficit will remain there.

    - If we keep on importing more than we export, somehow we must finance that deficit and this can only be financed via the reserves. The problem is that sooner or later the reserves will run out, so in a way there is a limit by how much the central bank can sustain a fixed exchange rate system. If it proves to be unsustainable, the central bank will have no other option other than devalue the currency.
- Intermediate –Regimes – Permutations (array of possibilities):
    - Adjustable Peg – it is like the fixed rate. The exchange rate may be revised after a period of years
    - Dirty Floating – when the rate is fixed but every now and then (more frequently), the central bank intervenes. There is an element of central bank intervention.
    - Crawling Peg – Refer to Diagram2. It is pegged but it is allowed to crawl (move within acceptable limits to the central bank).
    - Joint Float – when countries agree to fix their currencies with each other but they all float against other members outside their group. Between them they are fixed but they float against those who are outside.
    - Exchange Rate Band – in a way it is similar to the crawling peg but there are upper and lower limits. For example the currency can appreciate and depreciate by not more than 10%. It is left to fluctuate but not beyond the upper and lower limit.
- Free-Floating (Depreciation/Appreciation). Advantages:
    - It is up to the market to determine the optimal rate. The central bank does not need to worry about the issue of reserves. If we are importing more than we are exporting, then the market will automatically correct itself and we tend to observe depreciation. We start to export more and import less and the deficit will correct itself out.
    - It is a form of insulation against external shocks. If something happens and the price of oil goes up significantly therefore our import bill is going to increase. With a fixed exchange rate system, that will have a big impact in terms of downward pressure. Under this system, the currency will correct itself out and depreciate so there's no need of central bank intervention.
    - Whether government or the central bank, both of them are free to choose which ever policy they would like to adopt. If the government wants to expand fiscal policy, it will spend more money and will eventually lead to an increase in the current account deficit, however that will correct itself by the depreciation of the currency. Fixed entails a straight jacket system and this system allows for more flexibility.

  Disadvantages:
    - It may give rise to speculation. If there are a handful of investors who have what it takes in terms of capital and they decide to bet against that particular currency, they may create certain volatility in the markets. That will impact on either exporters or importers.
    - Speculation leads rise to uncertainty. In fixed, there is an element of stability but over here it is not possible.
    - It may have a negative impact on government responsibility.

3 systems that different countries adopt and each system is suited to different circumstances.

Depreciation is determined by the market forces whereas devaluation is determined by administrative decisions (the central bank decides). Refer to Diagram1.