Ecn 316: Monetary Economics   Lecture Note   2 Units

Course Content

- ✓ Theories of demand for money from Keynesian to post Keynesian theories
- ✓ Theories of interest rate
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Demand for Money

People hold their wealth in two broad forms:

  i.   idle cash balances which yield no income,

  ii.   Non-cash assets such as securities, houses, bags of rice, vehicles and other commodities.

Other commodities through which wealth is held yield some income, appreciate or depreciate in value over time. Wealth held as idle cash balances guarantees no income, instead it reduces in value during inflation. The decision to hold money as cash balances instead of spending it immediately in buying other assets is called the demand for money. Demand for money, therefore, refers to the total amount of money balances that people want to hold for certain purposes.

The Liquidity Preference Theory

Liquidity Preference is the extent to which a person prefers to hold cash balances instead of parting with it or keeping his wealth as other assets. Liquidity Preference theory states that "the stock of money held by the public will vary inversely with the rate of interest (price of money)." The higher the return on income-yielding assets, the less likely it is that cash will be held. There is a level to which interest rate will reach and people will no longer be willing to invest at all. This level is called the Liquidity trap level.   If an individual decides to hold all his wealth in the form of other wealth-creating or financial assets, he faces the danger of illiquidity (that is, having no cash to settle his immediate illiquidity obligations). To avoid the danger of illiquidity, he may prefer to hold money instead of other assets. This is what Lord J. M. Keynes called Liquidity Preference.

Apart from the level of income and rate of interest generated by other assets, there are other determinants of how much a person will be willing to hold as cash. These other factors include interval between pay days, general price level, level of expenditure, and availability of credit. These factors are, however, influenced by the level of income.

Other factors such as a person's attitude towards risks and expectations are equally influenced by the rate of return (or Interest Rate). When interest rates are high, more people will be willing to take risk.

Motives for Holding Money (DD for money)

Whoever is holding money is holding it to enable him get something else. Each person has his own reasons for holding money, and not because he wants to chew the paper called money. The demand for money is, therefore, said to be a derived demand. Lord John Maynard Keynes who propounded the Keynesian theory identified three reasons that prompt people to hold money. These reasons are transactions, precautionary and speculative.

i Transactions Motive

The first reason people hold money balances is to enable them pay for their normal day- to-day transactions. People hold money as a medium of exchange. It is generally accepted by individuals and firms in payment for goods and services. The transactions motive for demanding money arises from the fact that most transactions involve an exchange of money. Because it is necessary to have money available for transactions, money will be demanded. The total number of transactions made in an economy tends to increase over time as income rises.

Keynes observed that the level of transaction undertaken by individuals and society as a whole has a stable relationship with the level of income. Keynes, therefore, confirmed that "the demand for money for transactionary purposes was proportional to the level of income". This means that the higher the income level, the larger the amount held for transaction purpose. The Monetarists led by Milton Friedman also agreed that "the demand for money will be proportional to the level of income for each individual and hence for the aggregate economy. Therefore, money is held for the purchase of goods and services because of the non-synchronisation of the periods of income receipts and their disbursements. This is determined directly by the level of income. Given these factors, the transactions demand for money is a direct proportional and positive function of the level of income and is expressed as:

$L_t = kY$ where L_t is the transactions demand for money,

k is the proportion of income which is kept for transactions purposes, and Y is the income.

ii Precautionary Motive

The term "Precautionary Motives" refers to the desire to hold cash balances in order to meet expenditures which may arise due to unforeseen circumstances such as sickness and accidents. Uncertainties are a reality of life. We can never be quite certain what payments we have to make in the future. Lacking certainty, we therefore arm ourselves with money against emergencies. Like the transaction motive, it is relatively interest-inelastic unless the rate of interest is really very high.

As the case of transactions motive, the amount of money an individual holds for precautionary purposes is also dependent on the level of Income. The higher the level of income, the more the amount held for precautionary purposes. Both Keynesians and monetarists agree on this point. But the post-Keynesian economists believe that like transactions demand, it is inversely related to high interest rates. The transactions and precautionary demand for money will be unstable, particularly if the economy is not at full employment level and transactions are, therefore, less than the maximum, and are liable to fluctuate up and down. Precautionary demand, like transactions demand is a function of income and interest rates.

$Lp = (Y, r)$.

The demand for money for these two purposes-Transactionary and Precautionary is expressed in the single equation below:

$M1 = L1 (Y, r)$ where the amount held under these two motives

(M1) is a function of the level of income (Y), and (r) is the interest rate.

iii.   Speculative Motive

Speculative demand for money is the desire to have money for transactions other than those necessary for living, namely for investment and profitable purposes. If people expect prices to fall in the near future, for instance, they can suspend further purchase now, and hold more money waiting to buy when prices will fall. In the same way, if people think that prices are relatively low now and expect prices to rise in the near future they will use their money to buy financial assets which they will sell later when prices will rise. The amount of money for speculative purpose is not based on the level of income. It is determined by what people expect to gain or to lose by holding other assets. This expected gain or loss depends on the interest rate. People hold money to enable them speculates on the possible outcome of business events.

Lord Keynes used movement in bond prices to illustrate the speculative motive for holding money and how this is influenced by interest rates. This is expressed in the equation below as:

$V = R/r$ where V - is the current market value of a bond

R - is the annual return on the bond and

r - is the rate of return currently earned or the market rate of interest.

The post Keynesian Theory of Demand for Money:

The post Keynesian theories like the portfolio theories lay emphasis on the store of value function of money. The transactions theories lay more emphasis on the medium of exchange function of money.

The portfolio theory stress that people hold money as part of their portfolio of assets and predict that the demand for money depends on the return and risk offered by money and by other assets that people can hold instead of money. According to Tobins, an investor is faced with a problem of what proportion of his

portfolio of financial assets he should keep in the form of money (which earns no interest) and interest-bearing bonds.

➢ The Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to assemble an asset portfolio that maximizes expected return for a given level of risk. The theory assumes that investors are risk-averse; for a given level of expected return, investors will always prefer the less risky portfolio.

According to portfolio theory, the four factors determining money demand are:

i.   interest rates (lower interest rates increase money demand);

ii.   wealth (higher wealth leads to higher money demand);

iii.   risk of alternative assets (a greater risk of alternative assets tends to increase money demand); and

iv.   liquidity of those other assets in the case of conversion to liquid asset.

Assumptions of Portfolio Theory

i.   Investors are rational and work to maximize their utility.

ii.   Investors act solely on the basis of expected return and variance of return.

iii.   All investors have access to the same information.

iv.   There are no taxes or transaction costs.

In the opinion of Milton Friedman, money is a luxury like durable consumer goods, with a change in per capita income, peoples' standard of living changes and as result, they may desire to hold cash balances more or less accordingly to the change in the per capita income.

The transactions demand for money refers specifically to money narrowly defined to include only its liquid forms, especially cash and checking account balances. The transactions motive for demanding money arises from the fact that most transactions involve an exchange of money. Because it is necessary to have money available for transactions, money will be demanded. The total number of transactions made in an economy tends to increase over time as income rises.

Determinants of Money Demand

Apart from the factors identified by Keynes, other factors were later identified by Professor Milton Friedman in his modern quantity Theory of Money. These include the price level, the rate of change of prices or inflation real permanent income or wealth and return on bonds and equities. Therefore, the determinants of money could be seen as

(a) Income: Demand for money varies directly with the level of income, that is, the higher the level of income, the higher the level of income, the higher the level of money demand.

(b) Interest Rate: Demand for money varies inversely with the interest rate.

(c) Price level: There is direct positive relationship between money demand and the price level.

(d) The Rate of Price Changes: Inflation rate varies inversely with money demand. This is a weak determinant of money.

(e) Real Permanent Income: Real permanent income or wealth varies directly with money demand.

(f) Return on Bonds and Equities: The higher the return on bonds and equities the lower the demand for money.

Quantity Theory of Money

The quantity theory took the view that money was used only as a medium of exchange to settle transactions involving the demand and supply for goods and services. The theory is based on the simple identity between total money spend and the price level in the economy. The classical quantity theory of money was developed by Irwin Fisher in 1911 and was generally accepted view until the 1930's about the relationship between the amount of money in economy or circulation and the level of prices. It is a theory about how much money supply is needed to enable the economy to function.

The theory is illustrated with the equation:

$MV = PT$

Where M - is the money supply

V is the velocity of circulation i.e. the rate at which money changed hands in the society. P is the Price level

T rate of Transaction

Given the assumption that 'V' and 'T' are constant, the price level 'P' varies directly with the amount of change in money supply i.e. $P = MV$

Criticisms of Quantity Theory of Money

Today, no one accepts that the influence which money has on the economy can be explained in terms of a simple quantity theory. To a lesser or greater extent, they would question the three key assumptions necessary to convert the equation of exchange into a theory of the determination of prices. As we have seen, these three key assumptions were:

1. The velocity of circulation of money is constant.

2. The stock of money is an instrument which can be controlled.

3. Say s Law (supply creates its own demand) will operate.

The validity of these three assumptions is critically on the grounds that:

(a) Prices cannot respond quickly to changes in money supply;

(b) An increase in the distribution of wealth might result from an increase in the money supply and price levels;

(c) If people expect price to rise, they might decide to hold more of their wealth in physical asset and less in money and so the velocity of circulation will fall;

(d) People have optimistic mind about inflation.

Theory of Interest Rate

Interest is the price paid for inducing those with money to save it rather than spend it, and to invest in long-term assets rather than hold cash. Rates reflect the interaction between the supply of savings and the demand for capital; or between the demand for and the supply of money. The expectations theory of the term structure holds that the long-term interest rate is a weighted average of present and expected future short-term interest rates. If future short rates are expected to remain constant, then the long rate will equal the short rate (plus a constant risk premium). Keynes argues that the demand for money to satisfy the transaction and precautionary motives changes in response to changes in income, while the demand due to the speculative motive is sensitive to changes in interest rate. However, According to the classical economist, interest is a real phenomenon and the rate of interest is determined exclusively by the real factors, i.e., the supply of and demand for capital under perfect competition, interest rates. On this note therefore, Classical economists believe that interest rates are determined by the supply and demand for loanable funds, while Keynesians argue that interest rates are determined by the demand for money and the supply of credit.

The main theories of interest rates are: Theory of Austrian School; Theory of liquidity, Neo-Classical Theory; and Theory of loan.

Austrian School's theory: The Austrian school explains interest rates in terms of people's preference to spend in the present over the future. Interest rates are determined by the subjective decision of individuals to spend money now or in the future. In other words, interest rates are determined by the time preference of borrowers and lenders. The theory emphasis is on:

- ✓ Time-preference: When should spending or otherwise take place?
- ✓ Borrowing/lending: Should money be borrowed or lent out?
- ✓ Savings/investment/consumption: Should wealth be saved, invested or consumed?

Liquidity Preference Theory: Liquidity preference theory says that the more people prefer liquidity, the higher interest rates must rise to make them willing to hold bonds. Thus, the theory views interest rates as a payment for parting with liquidity. Liquidity preference theory says that interest rates adjust to balance

the desire to hold cash against less liquid assets. Liquidity preference is influenced by various factors, including income level, risk tolerance, time horizon, and future expectations. Understanding these factors is crucial when making financial decisions, as they can help individuals and businesses determine the most suitable allocation of their funds.

Neo-Classical Theory: This theory argues that the interest rates on loans are determined by the supply of and demand for loans in the market for loanable funds. The main assumptions of neoclassical economics are that:

✓ consumers make rational decisions to maximize utility,

✓ that businesses aim to maximize profits,

✓ that people act independently based on having all the relevant information related to a choice or action,

✓ and that money markets will self-regulate in response to supply and demand for money.

The neo-classical theory of interest or loanable funds theory of interest owes its origin to the Swedish economist Knut Wicksell. Neoclassical theory suggests that the firm's level of investment should depend only on its perceived investment opportunities measured by the firm's marginal Tobin's q, where marginal Tobin's q is the value of the investment opportunity divided by the cost of the required investment. Tobin's Q formula is an economic ratio used to compare a company or index's market value to its book or replacement value. One way that the formula is expressed is as **Q = Market Value / Total Assets**. It can be used to measure the relative value of a company's stock or the overall market.

The Q Ratio, or Tobin's Q Ratio, is a ratio between a physical asset's market value and its replacement value. The ratio was developed by James Tobin, a Nobel laureate in economics. Tobin suggested a hypothesis that the combined market value of all companies on the stock market should be about equal to their replacement costs. The ratio can be used for valuing a single company and even the whole stock market.

Formula of the Q Ratio

The original formula for the Q Ratio is:

$$Q\ Ratio = \frac{Market\ value\ of\ assets}{Replacement\ cost\ of\ capital}$$

However, in real life, it is very difficult to estimate the replacement costs of total assets. Thus, there is a modification of the original formula, in which the replacement costs of the assets are replaced with their book values.

$$Q\ Ratio\ =\ \frac{Equity\ Market\ Value\ +\ Liabilities'\ Market\ Value}{Equity\ Book\ Value\ +\ Liabilities'\ Market\ Value}$$

Equity Market value (MVE) is **the total monetary value of a company's equity. It is also being refers to as** market capitalization. This measure of a company's value is calculated by multiplying the current stock price by the total number of outstanding shares.

Equity book value (BVE), or "Shareholders' Equity", is the total money left after a company's assets have been sold off and if existing liabilities were paid down with the sale proceeds.

The Q Ratio can be calculated for the overall market:

$$Q\ Ratio\ =\ \frac{Value\ of\ stock\ market}{Corporate\ net\ worth}$$

Stock Market value is the worth of asset or a company on the financial market, according to market participants.

Corporate net worth is a performance indicator that reveals the value of the business's property after liabilities are paid.

Applications of the Q Ratio

The Q Ratio is widely used to determine the value of a company. If the ratio is greater than 1, the market value of a company exceeds the value of its booked assets. The company is overvalued as the market value reflects some unmeasured or unrecorded assets. A ratio greater than 1 indicates that a company's earnings higher than the assets' replacement costs. This fact can attract potential competitors who would try to re-create the business model to achieve some of the profits.

When the ratio is lower than 1, the value of the company's booked assets exceeds their market value. It implies that for some reason, the market undervalues the company. In such a case, the company may be attractive to potential purchasers who would be willing to buy the company instead of creating a similar company.

The ideal scenario is when the Q Ratio equals 1. It suggests that the market fairly values the company's assets.

Their theory was anchored on:

✓ Saving/investment/consumption: Decision on these and profitability.

✓ Profit rate of investment/investment risk: A consideration of these.

✓ Revenues: Expected income

✓ productivity/efficiency of capital: Returns on capital on which decision is made

Loan Theory: According to this approach, the interest rate is determined by the demand for and supply of loanable funds. The term loanable funds include all forms of credit, such as loans, bonds, or savings deposits. In other words, the market interest rate is seen as the price of loans and it is thought to be determined just the way the price of any other good or service is determined in the market. So, a rise in the supply of loanable funds from savers such as households is believed to cause the market interest rate to drop while a drop in the supply of loanable funds is seen as causing a rise in market interest rates. On the other hand, a rise in the demand for funds from borrowers such as businesses and governments is supposed to cause a rise in interest rates while a drop in their demand for funds is expected to cause a fall in interest rates. In short, the supply of funds from lenders and the demand for funds from borrowers are seen as influencing the market interest rate. Loanable funds theorists argue that the interest paid on loans offers an incentive for savers to lend their money since they need to wait a certain period of time before they can get their original investment back. In other words, interest is seen as fair compensation paid to savers for waiting.

This theory was based on the followings:

✓ Interest rate (natural/market): Determined by demand and supply of loanable fund.

✓ Time-preference (consumption/savings / investment): Which gives the best satisfaction?

✓ Productivity/capital: How productive the capital is?

✓ Incomes (for today, future): Decision for today or future stream of income

✓ Population/labor force: Comparison of demanders and suppliers of loanable fund

Supply of Money

The supply of money in any economy at any particular period is the total sum of all money held by all members of the society. Generally, money supply is taken as the total amount of money in circulation at any given time e.g. notes and coins and demand deposits in commercial banks.

It is normally assumed that the nominal money supply is exogenously determined i.e. it is supplied by the monetary authority or Central Bank. But the real money supply is endogenously determined since the price level variation cannot be fixed.

The following three economic factors have been found to determine the supply of money or the quantity of money in the economy.

(a) The behaviour of banks concerning the amount of reserves that they want to hold. This decision on reserves is a function of the profit maximising behaviour of banks and the expectation of the managers with respect to economic environment

(b) The behaviour of the non-bank public with respect to the way they divide their wealth or money holdings between cash and demand deposits (i.e. the proportion of total wealth that people want to hold in cash).

(c) The behaviour of the monetary authorities with regards to the decisions about the size of the monetary base, Legal reserve ratio, and the discount rate. (The monetary base is the currency in circulation plus all the assets that banks are allowed to count while computing their legal reserve ratio).

In determining the level of money through the exogenous factors, the government increases or reduces the supply in accordance with the desired economic target they want to achieve. Ojo, M. O. (1993) puts it this way "a Monetary Control framework begins by establishing a link between the monetary control instruments and the ultimate target for output, growth, inflation and the balance of payments"

Factors that affect Money Supply

The general belief is that the Central Bank issues notes and coins on behalf of the Federal Government. It must be the Central Bank that determines the stock of money supply. This may not be entirely true. Five factors that could affect money are:

(i) Monetary base or High Powered Money: The money supply will naturally increase if the Central Bank expands the monetary base. The monetary base or high powered money is the total of bank reserves plus currency in the hand of the public.

(ii) Credit Creation: When banks create credit, the credit will in turn lead to demand deposit and so on. The extent to which commercial banks are allowed to create credit will therefore affect the extent of money supply.

(iii) Portfolio behaviour of the Public: If most people keep their money in the bank, the banking system will have Liquid reserves to lend out and create derivative deposit which is the deposit created through lending. If the marginal propensity to hold currency increases, the Liquidity of commercial bank will go down and money supply will similarly fall.

(iv) Reaction policies of the Central Bank: Monetary policies of the CBN applied in reaction to the dictates of the economy will have effects on money supply either expansionary or contractionary.

(v) Foreign Exchange Transactions: Domestication of Foreign Exchange will have the tendency to increase domestic money supply.

Specifically, money supply is also influenced by the other following factors:

(a) Total reserves supplied by the Central Bank: If the total reserve supplied by the Central Bank is high, money supply will be high.

(b) Reserve Requirements: If the reserve requirement - percentage of commercial banks deposits legally required to be kept with the Central Bank is high money supply will be low.

(c) If the non-bank public increases its demand for time deposits, money supply will increase.

(d) Demand for Currency: If the non-bank public increases its demand for currency, money supply will increase.

(e) Demand for excess reserves: If commercial banks demand for excess reserves, money supply decreases and vice versa.

(f) Interest Rates: There is a positive relationship between money and interest rate. That is, the higher the interest rate the higher the money supply.

(g) The Bank Rate: If the rate at which commercial banks borrow from the Central Bank or discount bill rises, money supply falls and vice versa.

Theories of inflation

The theory of inflation asserts that money supply growth is the cause of inflation. Faster money supply growth causes faster inflation. In particular, 1% faster money supply growth causes 1% more inflation. With other things constant, the price level is proportional to the money supply.

The more money in circulation, the more it will end up in hands of people and contribute positively to inflation. It is determined by two factors: First by printing done by central bank and second credit given by the financial sector.

The real bills doctrine (also known as the backing theory) thus asserts that inflation results when money outruns its issuer's assets. The quantity theory of money, in contrast, claims that inflation results when money outruns the economy's production of goods.

We have Demand-Pull Inflation Theory: Demand-pull is a form of inflation. It refers to instances when demand for goods and services prices can be pulled higher by an increase in aggregate demand that outstrips the available supply of goods in an economy exceeds the available supply of those goods and services in the economy. Economists suggest that in the monetarist view, the velocity of circulation of money (V) is seen as unstable, so when the money supply (M) increases, there is an increase in purchases of

goods and services. Nevertheless, if there is no increase in real output, this will cause prices to rise, causing inflation.

Cost-Push Inflation Theory: Cost-push inflation theorizes that as costs to producers increase from things like rising wages, these higher costs are passed on to consumers in the form of increase in commodity prices.

Cost-push inflation happens when there is a decline in the supply of goods and services and demand remains unchanged or even grows, driving prices and inflation higher. Cost-push inflation is the decrease in the aggregate supply of goods and services stemming from an increase in the cost of production. Factors such as rising wages, raw material costs, taxes, and exchange rate fluctuations contribute to this type of inflation

General Ways of Controlling Inflation in Nigeria

(1) Price Control Measure: This involves the setting up of Price Control Board by the government which fixes maximum prices charged for certain commodities experiencing inflation. Experience, however, has shown that this system bedeviled with a myriad of problems does not work. The Nigerian case is typical example.

What usually results are hoarding, profiteering and black-marketing, thus negating the initial aims.

(2) Wage Control or Wage Freeze: Most of governments place freezes on wage increases as a measure to combat inflation but this policy does not work or is ineffective since workers have deviced methods of making the government or employers of labour dance to their tune. These ways include go-slow, work-to-rule, industrial actions, etc. These are most often used in democratic nations/societies.

(3) Monetary Policy: This involves the use of traditional monetary instruments to reduce the quantity of money in circulation. These include increase in the Bank or Discount Rate, increase in the Liquidity ratio, use of open market operation -contractionary monetary policy in this case, sectoral allocation or special directives, etc., however, the experience in the developing world has shown that these traditional instruments of monetary policy have a lot of deficiencies hence their effectiveness.

(4) Fiscal Policy: A combination of increase in personal income tax and reduction in government expenditure may prove effective especially when inflation is demand- pull in nature. These reduce the purchasing power of consumers' thus reducing demand and prices of commodities.

(5) Total Ban on the importation of certain items: Especially when inflation is imported, the government is strongly tempted to place total ban on the importation of certain non-essential items. However, retaliation by other nations and political pressure lead to the lifting of the ban no sooner than it was placed hence the ineffectiveness of such a policy.

(6) Increase in the Production of Goods and Services: Increase in the production of goods and services are the most effective measure to inflation. Increase in the supply of products will naturally force prices down. In Nigeria, concrete efforts should be made to increase production of essential but scarce commodities.

(7) Over-hauling of the entire Distribution Network: Only genuine distributors should be appointed and any one found hoarding and profiteering should be prosecuted to serve as a deterrent to others.

Phillips Curve Theories: In the Keynesian economic model, too little aggregate demand brings unemployment and too much brings inflation. Thus, you can think of Keynesian economics as pursuing a "Goldilocks" level of aggregate demand: not too much, not too little, but what is just right. Phillips found a consistent inverse relationship: when unemployment was high, wages increased slowly; when unemployment was low, wages rose rapidly. Phillips conjectured that the lower the unemployment rate, the tighter the labour market and, therefore, the faster firms must raise wages to attract scarce labour. The Phillips curve states that inflation and unemployment have an inverse relationship. Phillips claims that with economic growth comes inflation, which in turn should lead to more jobs and less unemployment.

Higher inflation is associated with lower unemployment and vice versa. The Phillip curve shows that there is inverse relationship between inflation and unemployment as can be seen in the figure below.
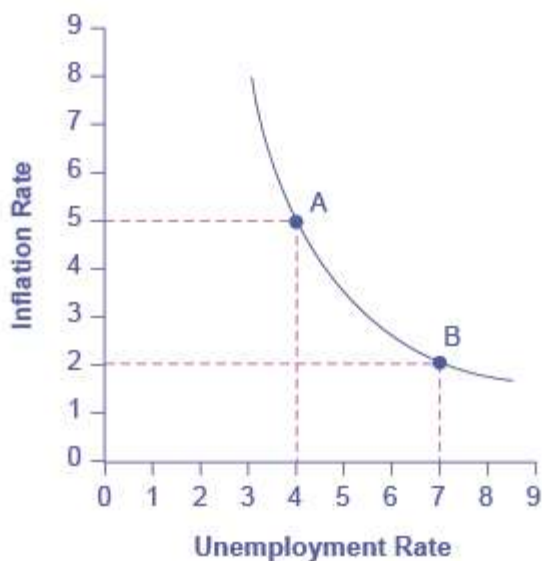
Multiplier

Multiplier broadly refers to an economic factor that, when increased or changed, causes increases or changes in many other related economic variables. In terms of gross domestic product, the multiplier effect causes gains in total output to be greater than the change in spending that caused it. **An economic multiplier** is the amount of change that occurs when an external force, such as added money, investment, consumption works on other parts of the economy. It is used to measure money supply and how an addition

to one part of it can impact the money supply as a whole. The different types of multipliers in economics are the Fiscal multiplier, Keynesian multiplier, Employment multiplier, Consumption multiplier, investment multiplier, income multiplier.

The Keynesian or fiscal multiplier theory demonstrates that the economy flourishes as the government increases spending and the net gain is greater than the amount of money spent. The Keynesian Multiplier is an economic theory that asserts that an increase in private consumption expenditure, investment expenditure, or net government spending (gross government spending – government tax revenue) raises the total Gross Domestic Product (GDP) by more than the amount of the increase.

The investment multiplier: In a closed economy with no government sector, the multiplier shows the impact of a change in investment on national income. There is only one leakage from the circular flow.

 Multiplier = 1/marginal propensity to save**. >1/MPS**

Investment multiplier emphasised that one individual's expense is another person's income. When governments spend money, a chain of consumption and expenditure increases the total income many times its original investment. The extent of the investment multiplier depends on two factors: the marginal propensity to consume (MPC) and the marginal propensity to save (MPS). A higher investment multiplier suggests that the investment will have a larger stimulating effect on the economy.

The ratio of ΔY to ΔI is called the investment multiplier. It can be derived, as follows, from the equilibrium condition (Y = C + I + G) together with the consumption equation

(C = a + bY). 1

The Investment Multiplier = $\Delta Y / \Delta I$ = I / I-C = I / F...2

While four sectors economy comprises of household, business sector, government and foreign income

Y=C+I+G(T)+(X-M). ……………………………………………………………………………….3

From the above, Y is income, C is consumption, S is savings, T is tax which form government income, G is government expenditure, X is export and M is import. It is expected that export should exceed import for the economy to have favourable balance of trade.

An example of how to determine the income of a nation using the above identity is presented below. Before the income is determined, the following information is required.

Y=C+I+G+(X-M)

$C=C_0+cY$

I=S

C= c(Y-T+R)

$T=T_0$

$R=R_0$

$I=I_0$

$G=G_0$

$X=X_0$

$M=M_0+mY$

Substituting the above into equation 1 for a two sector economy, we have

$Y=C+I$

$Y= C_0+cY+ I_0$

$Y- cY = C_0+ I_0 = Y(1-c)= C_0+ I_0$

$$Y= \frac{C_0+ I_0}{1-c} \quad\text{.. 4}$$

The multiplier is $$\frac{1}{1-c} \quad\text{..5}$$

C=MPC. The multiplier is $$\frac{1}{1-MPC}$$

S=MPS

The calculation of multipliers can be done through the followings:

For a three sector economy where government is involved, substituting the above into equation 2 for a three sector economy, we have

$Y= c(Y- T_0+ R_0)+ I_0 + G_0$

$Y= c(Y- T_0+ R_0)+ I_0 + G_0$

$Y= cY- cT_o+ cR_o+ I_0 + G_0$

$Y- cY= I_0 + G_0- cT_0+ cR_0$

$Y(1-c)= I_0 + G_0- cT_0+ cR_0$

$$Y = \frac{1(I_0 + G_0- cT_0+ {}_cR_0)}{(1-c)} \quad\text{..6}$$

From equation 6 above, transfer payment multiplier will be

$$\frac{dy}{dTo} = \frac{c}{1-c} \quad\text{..7}$$

If we assume that tax comprises of autonomous tax and personal income tax where our tax identity reads

$T=T_0+ty$

The marginal propensity to tax is

$MPT= \frac{dT}{} = t/dy$

Where the government want to change national income by changing investment expenditure, multiplier = 1/MPS while the value of investment expenditures that must be incurred for the government to achieve her desire income can be ascertained through the use of formula below:

K = ΔY/ΔI

Where the government want to change national income by changing public expenditure, multiplier = 1/MPC while the value of public expenditures that must be incurred for the government to achieve her desire income can be ascertained through the use of formula below:

K = ΔY/ΔC

Example: If the marginal propensity to consume is 0.75. Calculate
   i.   The Multiplier
   ii.   By how much must consumption expenditure be increased if the government wants to increase national income by 2000

 Solution:
i.   The multiplier K = 1/MPC = 1/1-0.75 K= 1/0.25 K = 4 times
ii.   K = ΔY/ΔC 4k = 2000 k = 2000/4 k = ₦500

Example: If the marginal propensity to save is 0.5, calculate:
   i.   The multiplier
   ii.   The level of investment which is required to raise income by 3000.
Solution:
   i.   The multiplier = 1/MPS = 1/0.5 =2times
   ii.   K = ΔY/ΔI 2k = 3000 k = 3000/2 k= ₦ 1,500

Example: If the marginal propensity to consume is 0.6 by how much will national income be increased if government expenditure is increased by N4,000

Solution: 1/1-MPC = 1/1-0.6 = 1/0.4 = 2.5

K = ΔY/ΔG = 2.5 = ΔY/ΔG = 2.5 = ΔY/4000 = 10,000

10,000 - 4,000 = N6,000

Example: Assume a simple two-sector economy where Y = C+I. C =Co + bY, and I = Io. Assume further that Co = 85, b = 0.9 and Io = 55. The equilibrium level of income can be calculated in terms of (1) the general parameters and (2) the specific values assigned to these parameters.

Solution:

   i.   The equilibrium equation is   Y = C + I

Substituting for C and I   Y = Co + bY + Io

Solving for Y,   Y – bY = Co +Io

      Y(1 – b) = Co +Io

            Y = Co +Io/1-b

The solution in this form is called the reduced form. The reduced form or solution equation expresses the endogenous variable (Y) as an explicit function of the exogenous variables (Co Io) and the parameter (b)

ii.   The specific equilibrium level of income can be calculated by substituting the numerical values for the parameters in either the original equation (a) or the reduced form (b):

(a). Y = Co + bY + Io = 85 + 0.9Y + 55

   Y -0.9Y = 140   0.1Y = 140   Y = 1400

(b). Y = Co +Io/1-b   85+55/1-0.9   Y=140/0.1=1400

Shift in Aggregate Demand Functions (the Multiplier)

The multiplier effect is the ability of given initial change in planned expenditure to cause a bigger change in total   equilibrium national income e.g. what will be the effect of increase in investment expenditure on national income. This can be obtained by taking the partial derivative with respect to investment in the equilibrium national income. That is:

$$Y = a + \frac{C_0 + I_0 + G_0 - bT_0 + bR_0 + X_0 - M_o)}{(1 - b)}$$

Investment multiplier will be

$\partial Y/\partial I = 1/(1 - b)$

Consumption multiplier will be

$\partial Y/\partial C = 1/(1 - b)$

Government multiplier will be

$\partial Y/\partial G = 1/(1 - b)$

Import multiplier will be

$\partial Y/\partial M = -1/(1 - b)$

Export multiplier will be

$\partial Y/\partial X = 1/(1 - b)$

Tax multiplier will be

$\partial Y/\partial T = -b(1 - b)$

Transfer payment multiplier will be

$\partial Y/\partial R = b/(1 - b)$

Acceleration Principle explains the process by which an increase (decrease) in the demand for consumer goods leads to an increase (decrease) in the demand for capital goods. This is based on the fact that the

demand for capital goods is based on the demand for consumer goods. Therefore, the acceleration coefficient is the ratio between induced investment and an initial change in consumption expenditure.

Balanced Budget Multiplier

Balanced budget multiplier states that "equal increase in the level of government expenditure and taxes will raise the level of income by exactly the same amount of increase in government expenditure and taxes" This is usually fulfilled in a closed economy. That is:

$$Y = \frac{a + I_0 + G_0 - bT}{(1 - b)}$$

$$BBM = \partial Y/\partial G_0 + \partial Y/\partial T_0$$

$$BBM = 1/(1 - b) + 1/(1 - b)$$

$$BBM = (1 - b)/(1 - b)$$

$$BBM = 1$$

Employment multipliers: This measure how the creation or destruction of output or employment in a particular industry translates into wider employment changes throughout the economy. The concept of Employment Multiplier was introduced by R.F. Kahn in 1931 as a ratio between the total increase in employment and primary employment, i.e.

$K^1 = \Delta N/\Delta N_1$ where K^1 stands for the employment multiplier, ΔN_1 for the increase in total employment and ΔN_1 for the increase in primary employment.

High powered money Concepts

High powered money refers to the aggregate of the total currency (coins and notes) that are held by the public and the reserves of commercial banks. It is useful in the creation of money supply. The high powered money consists of the currency as well as the cash reserves with banks whereas the ordinary money is consist of currency and demand deposit (DD). The high powered money = R+C where R stands for currency with people and C stands for cash reserves of the banks. M1, M2 and M3 are measurements of the nations' money supply, known as the money aggregates. M1 includes money in circulation plus checkable deposits in banks. M2 includes M1 plus savings deposits and money market mutual funds. M3 includes M2 plus large time deposits in banks.

Bitcoin (BTC) is a cryptocurrency (a virtual currency) designed to act as money and a form of payment outside the control of any one person, group, or entity. This removes the need for trusted third-party involvement (e.g., a mint or bank) in financial transactions.

Money creation is the process leading to an increase in the money supply. In most modern economies, money is created by both central banks and commercial banks. Banks making loans and consumers repaying them are the most significant ways in which bank deposits are created and destroyed in the modern economy.

Origin of Money Creation: The barter system likely originated 6,000 years ago. The first coin we know of is from the 7th century BC and the first paper money came into the world around 1020 AD. Eventually, medieval banking systems gave way to the gold standard, which in turn gave way to modern currency.

Money is created through the reserve ration. The formula for the money multiplier is simply 1/r, where r = the reserve ratio. It is the reciprocal of the reserve ratio. When r is the reserve ratio for all banks in an economy, then each naira of reserves creates 1/r naira of money in the money supply.

The money multiplier is the amount of money that the banking system can generate with each naira of reserves. The money multiplier is calculated by dividing one by the reserve ratio. In other words, the money multiplier is the reciprocal of the reserve ratio.

How much would be created from a loan of N1,800.00 at 6.5% p. m. compound interest at the end of 3 months?

Solution: CIR = $P\{1 + r/100\}^n$ = $1800\{1 + 13/200\}^3$ = $1800\{213/200\}^3$ = **₦2,174.31**   ₦374.31

Controls of money supply

To ensure a nation's economy remains healthy, its central bank regulates the amount of money in circulation. Influencing interest rates, printing money, and setting bank reserve requirements are all tools central banks use to control the money supply.

Instruments of Controlling Money Supply

Basically, the central bank of countries employs any of the followings to control the supply of money in the economy.

a. Open market operations (OMO): This refers to the sale and purchase of securities (treasury bills which is a bond or other type of debt obligation that is issued by a government with a promise to repay such debt obligation upon the maturity date of the instrument.) in the money market by the central bank of the country. This instrument is facilitated by highly developed financial markets. Financial markets are veritable agents to a successful use of open market operations in any economy. The sales or purchase of the securities may be adopted in line with the focus of objective to be pursued. Other forms of securities are Nigerian Treasury Certificates, Federal Government Development Stocks and Government Bonds.

b. The cash reserve ratio (CRR): This is the proportion of money in the form of demand and time deposits (net demand and time liabilities) that the commercial bank has to keep with the central bank of the country on a scheduled basis. This ratio may be adjusted or reviewed to a particular direction depending on the objective of the central bank.

c. Statutory Liquidity Ratio (SLR): This is a requirement that commercial banks have to keep a certain proportion of their demand and time deposits as liquid assets. A monetary policy which is expansionary in nature is implemented by decreasing the interest rates, thus increasing the market liquidity. And a monetary policy which is contractionary in nature is implemented by increasing the interest rates, thus decreasing the market liquidity.

d. **Bank Rate**: This is the interest rate a nation's central bank charges to its domestic banks to borrow money in order to stabilize the economy. There is difference between Bank rate and interest rate. Bank rate is a quantitative tool of credit control in the economy to control the situation of inflation and deflation while interest rate is not a tool of credit control as it is not determined by the central bank but business tool for the financial institutions.

e. **Discount Rate:**

f. The Repo Rate: This is also called repurchase agreement or repurchasing option. It is the interest rate at which commercial banks borrow money from the central bank, pledging government securities as collateral. The central bank borrows money from commercial banks when there is excess liquidity in the market and vice versa. However, reverse repo rate is the rate at which the bank can park their collateral of government securities with the central bank.

g. Selective Credit Control: This is a policy where the central bank give a directive on which sector of the economy be considered for credit facility. This may be a deliberate policy to improve the selected sector's contribution to aggregate output or to restrict other sectors from having access to credit so as to reduce the money in circulation. By wanting to increase the money supply, such policy can be relaxed to accommodate all the sectors in the economy to have unlimited access to credit facility.

h. Moral Suasion: This is a passionate appeal to the commercial banks to direct its credit facility to certain directi0n of the economy depending on the policy to be pursued. If it is to reduce the money supply, it will be a contractionary appeal and vice versa.

Cambridge (quantity) and Keynesian Monetary theory

The Fisherian and Cambridge Monetary theory versions lead to the same conclusion that there is a direct and proportional relationship between the quantity of money and the price level and an inverse

proportionate relationship between the quantity of money and the value of money. An alternative version, known as cash balance version, was developed by a group of Cambridge economists like Pigou, Marshall, Robertson and Keynes in the early 1900s. These economists argue that money acts both as a store of wealth and a medium of exchange. Both quantity theories, Cambridge and classical, attempt to express a relationship among the amount of goods produced, the price level, amounts of money, and how money moves. An American economist named **Irving Fisher** provided the version of the transaction of the quantity theory of money in his book 'The Purchasing Power of Money' in the year 1911. According to Fisher, as the quantity of money in circulation increases the other things remain unchanged. Algebraically, we represent the cash-balances theory with the Cambridge equation: Md=kPY. Md is money demand, PY is nominal income, and k is a number between zero and one that indicates **the fraction of our nominal income held as money**. That is, increasing the money supply by 20% will result in an increase in the price level by 20% as well. The price level is also associated with inflation. Thus, an increase of 20% in the money supply leads to a 20% inflation rate increase.

According to Keynes, an increase in the quantity of money increases aggregate money demand on investment as a result of the fall in the rate of interest. This increases output and employment increase money supply in the beginning but not the price level. New Keynesian Economics comes with two main assumptions.

✓ First, that people and companies behave rationally and with rational expectations.

✓ Second, they assume a variety of market inefficiencies – including sticky wages and imperfect competition.

Keynes's theory of monetary policy is composed of three concepts—namely, **the investment multiplier, the marginal efficiency of capital and the interest rate**. By analyzing how these three concepts interact in the short period, Keynes explains why he is opposed to countercyclical monetary policies. Keynesian economists believe that a troubled economy continues in a downward spiral unless an intervention drives consumers to buy more goods and services.

In the field of monetary theory, post-Keynesian economists were among the first to emphasise that money supply responds to the demand for bank credit, so that a central bank cannot control the quantity of money, but only manage the interest rate by managing the quantity of monetary reserves. Thus, the instruments of the Post Keynesian monetary policy rest on three pillars: interest rate, debt management and regulation. The post Keynesian theories like the portfolio theories lay emphasis on the store of value function of money. The transactions theories lay more emphasis on the medium of exchange function of money.

On the conclusion therefore, Keynesian economic theory states that the government should increase aggregate demand to boost the economy. On the other hand, monetarist economics states that the government can encourage economic stability by controlling the amount of money in an economy.

International monetary problems

Monetary relationship problems arise due to the different value of currencies across countries of the world. This happens as no country can exist independently. The need to cross trade in goods and services called for comparing currency values and since development among nations is not the same, there is also the possibility of differential value of currencies.

The four major types of international monetary regimes are specie standard, managed fixed exchange rate, free float, and managed float. They differ in their solution to solving economic problems.

a. **Specie standard**: In the Gold Specie Standard, **actual gold coins are issued**. This system is based on the value of one of those coins, usually the one manufactured with the most gold. In this system, a coin made of 100% gold would have a value double a coin made of half gold and half silver. Money consisted of either specie (**gold, silver or copper coins**) or of specie-backed bank issue notes. **Specie money** is money used in payment in coin or bullion as distinguished from payment in paper money. Bullion refers to physical gold and silver of high purity that is often kept in the form of bars, ingots, or coins. Bullion can sometimes be considered legal tender, and is often held as reserves by central banks or held by institutional investors.

b. **Managed fixed exchange rate**: A fixed exchange rate is a regime applied by a government or central bank that ties the country's official currency exchange rate to another country's currency or the price of gold. The purpose of a fixed exchange rate system is to keep a currency's value within a narrow band that will be able to sustain the growth of the economy.

c. **A free float**: This is a situation when the exchange rate for a country's currency is determined by the supply and demand of that currency on the international currency markets. A floating rate in which a country's monetary officials will occasionally intervene in international currency markets to buy or sell in international transactions.

d. **Managed float**: A managed floating exchange rate (also known as dirty float') is an exchange rate regime in which the exchange rate is neither entirely free (nor floating) nor fixed. Rather, the value of the currency is kept in a range against another currency (or against a basket of currencies) by central bank intervention. This is when the controlling financial body will be manipulating the exchange rate at will, choosing to let it free float, fixed to a rate, or kept within a desirable range.

Determination of Currency value

Currency value is determined by a number of factors, they are:

1. Aggregate supply and demand,

2. Interest rates,

3. Inflation,

4. Capital flow,

5. Money supply,

6. Exchange rates.

The Nigerian money market

This is a market for short-term debt instruments. The major function of the money markets is to facilitate the raising of short-term funds from the surplus sectors to the deficit sectors of the economy.

The money market refers to trading in very short-term debt investments. At the wholesale level, it involves large-volume trades between institutions and traders. At the retail level, it includes money market mutual funds bought by individual investors and money market accounts opened by bank customers. The key participants are the Federal Ministry of Finance (FMF), Debt Management Office (DMO), Central Bank of Nigeria (CBN), deposit money banks (DMBs), discount houses, businesses and individuals. There are two types of money market accounts. Deposit accounts and mutual funds

 A deposit account is a bank account maintained by a financial institution in which a customer can deposit and withdraw money. Deposit accounts can be savings accounts, current accounts or any of several other types of accounts.

 A mutual fund is a company that pools money from many investors and invests the money in securities such as stocks, bonds, and short-term debt, equity funds (stocks), (funds invest in shares of companies), debt Funds invest in bonds, providing a steady income.

Features of Nigerian Money Market

The money market is an organized exchange market where participants can lend and borrow short-term, high-quality debt securities with average maturities of one year or less.

It enables governments, banks, and other large institutions to sell short-term securities to fund their short-term cash flow needs.

As they are low-risk instruments with short maturity periods, they are highly liquid. Money market instruments are usually issued by the government, banks and corporations having high credit ratings; hence, they are considered to be quite secure.

The money market is a short-term lending system. Borrowers tap it for the cash they need to operate from day to day. Lenders use it to put spare cash to work.

Instruments of money markets: Money markets include markets for such instruments as bank accounts, including term certificates of deposit; interbank loans (loans between banks); money market mutual funds; commercial paper; Treasury bills; and securities lending and repurchase agreements.

Objectives of Money Market

    a.   To provide lenders with sufficient liquidity due to short-term securities.

    b.   To enable lenders to convert idle funds into profitable investments.

    c.   To follow the rules and regulations of Government and authoritative bodies.

    d.   To control and regulate the level of liquidity in the economic system

Benefits of Nigerian Money Market
i.   Creation of opportunity to earn increased yield on short term investment.
ii.   Creates liquidity to meet short term obligations.
iii.   Safer as an investment since investor receives collateral.
iv.   It facilitates the smooth functioning of the economy.

Operations of the Money Market
A money market fund is a kind of mutual fund that invests in highly liquid, near-term instruments. These instruments include cash, cash equivalent securities, and high-credit-rating, debt-based securities with a short-term maturity.

Monetary and Fiscal Policy
Monetary policy is an economic policy that manages the size and growth rate of the money supply in an economy. It is a powerful tool to regulate macroeconomic variables. Monetary policy is enacted by a central bank to sustain a level economy and keep unemployment low, protect the value of the currency, and maintain economic growth. By manipulating interest rates or reserve requirements, or through open market operations, a central bank affects borrowing, spending, and savings rates. During a period of high inflation, contractionary monetary policy is used to reduce the amount of money in circulation while expansionary monetary policy is used when economic conditions are weak. Depending on the level of financial development of a country, monetary policy is usually implemented through the banking system and financial markets. Implementing monetary policy involves interactions between the monetary authorities and financial intermediaries, using tools of monetary policy

Benefits of Monetary Policy
1. Stimulating economic growth by lowering interest rates
2. Affordable borrowing
3. Encouraging investment
4. Expanding production
5. Boosting employment
6. Controlling Inflation

Fiscal Policy
Fiscal policy is the use of government spending and taxation to influence the economy. Governments typically use fiscal policy to promote strong and sustainable growth and reduce poverty. The overall

objective of fiscal policy is **to** maintain the condition of full employment, economic stability and to stabilize the rate of growth. For an under-developed economy like Nigeria, the main purpose of fiscal policy is to accelerate the rate of capital formation and investment. A contractionary policy is a measure to reduce government spending or the rate of monetary expansion by a central bank. An expansionary policy is a measure to increase government spending or the rate of monetary expansion by a central bank

Objectives of Fiscal Policy

1. Income redistribution
2. Maintaining favourable balance of payments
3. economic growth,
4. maintain price stability
5. Control inflation
6. Boosting Employment
7. Promotion of savings

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