

DISTANCE EDUCATION MODULE
ON
MONETARY ECONOMICS (ECON -4031)

ARBA MINCH UNIVERSITY
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PREFACE

Dear distance learners! I am so pleased to come up with this work towards achieving our aspiration of producing properly educated economists throughout the country. I exerted much effort to produce simple and precise reading material for our esteemed distance students and other interested readers.

As any type of economics course, monetary economics concentrates on the three levels of economic studies: description, analysis and policy. However, the broader objective of the course is to examine the relevance of various monetary theories and their empirical evidence to aggregate economic activity. The specific objective of this course includes: to understand evolution of money in the historical context, to explain the existence and economic role of Bank and non-Bank Financial institutions, to demonstrate theories of Money, money demand and its determinants, to demonstrate the money supply process, monetary base, the determinants of money supply, how the behavior of the general public and the banking affect the money creation process, to understand the various goals, instruments and targets of central banks, and finally to examine the relevance of various theories of money demand and supply, and monetary policy instruments to the context of National Bank of Ethiopia (NBE).

Dear learners and other interested readers! I hope that you will find this material worth reading. And perhaps, if any editorial or technical errors are committed, they are all mine.

Teklebirhan Alemnew

TABLE OF CONTENT

Chapter 1: Money and Monetary Theory	1
1.1. Meaning, functions and the microeconomic role of money.....	1
1.2. Forms of money	9
1.3. Measurements of money	11
1.4. Evolution of the payment system	15
1.5. The evolution of money and the payment system in Ethiopia.....	17
Chapter One: Review Questions.....	19
Chapter 2: An overview of the Financial System	21
2.1. Functions and Importance of Financial System	21
2.2. The Structures of Financial Market	25
2.3. Financial Instruments	27
2.4. Financial intermediaries	30
2.5. Ensuring Sound Financial Management	36
2.6. Financial Development and Economic Growth.....	37
Chapter Two: Review Questions	39
Chapter 3: The demand for Money and other assets.....	42
3.1. Classical theories of money Demand	42
3.2. Keynes's liquidity preference theory.....	46
3.3. Post Keynesians developments in monetary theory.....	51
3.4. Friedman's modern quantity theory of money.....	58
3.5. Comparison on Keynesian Money Demand Model and Friedman's Money Demand Model	61
Chapter Three: Review Questions.....	66
Chapter 4: The Money supply Process	68
4.1. Players in the Money Supply Process	68
4.2. Central Bank Balance Sheet and Control of the Monetary Base.....	71
4.3. Multiple Deposit Creation.....	79

4.4. Monetary Supply Model and Money Multiplier	88
4.5 Factors that determine the money multiplier.....	94
Chapter Four: Review Questions.....	96
Chapter 5: Central Banking and Monetary Policy	99
5.1. Central Banking & the Functions of Central Bank	99
5.2. Central Bank independence	102
5.3. Goals of Monetary Policy	104
5.4. Tools of Monetary Policy	111
5.5. Central Bank Strategy	120
5.6. Transmission Mechanism of Monetary Policy and Empirical Evidence.....	127
Chapter Five: Review Questions	139
Chapter 6: Monetary Policy in Ethiopia.....	142
6.1. Powers and Functions of the National Bank of Ethiopia.....	142
6.2. Monetary policy objectives of the NBE.....	143
6.3. Monetary Policy Strategy/Targeting Framework of NBE.....	144
6.4. Monetary Policy Instruments of NBE.....	146
6.5. Exchange Rate Regime in Ethiopia.....	147
Chapter Six: Review Questions.....	148
Module References	150

CHAPTER ONE

MONEY AND MONETARY THEORY

Dear distance learner! The main objective of this chapter is to introduce the nature of money- what it is, what it works and its critical role in the functioning of the economic system. By the end of the chapter, you are expected to know:

- ✎ What exactly money is;
- ✎ The essential microeconomic (efficient resource allocation) role which money plays in the economy;
- ✎ The basic functions of money and the importance of each type of money;
- ✎ How money is measured
- ✎ The evolution of money from the bulky commodity money form of ancient times to the current electronic forms of money today;
- ✎ How the modern domestic and international payments systems work, and how they have been changing rapidly in recent years; and
- ✎ The evolution of money and the payment system in Ethiopia

1.1. Meaning, Functions and the Microeconomic Role of money

1.1.1. Meaning of Money

? *Dear distance learner! Can you explain the meaning of money in your own word?*

Before formally defining money, let's do some brain storming. Monetary economics is the economics of money demand, money supply, and monetary policy. Primitive societies were using the barter system, where there is no need of money, for their day to day exchange activities. Simply in this system commodities were exchanged for one another.

? *Dear Learner! What are the major problems/limitations of Barter System?*

However, with this system there were a lot of problems:

- a) *Problem of measuring the value of commodities:* - Labor was taken as the yardstick. The labour content of the commodities represented the value of the commodities. But labour

is heterogeneous. With more efficiency, lesser and lesser labour hours are required to accomplish a given job.

- b) *Problem of Divisibility*: this is a problem with commodities. Commodities are not easily divisible. E.g. chair vs. table
- c) *Problem of Savings*: space, quality, and durability problems with commodities.
- d) *Transportation problems*.

Generally, in a barter economy people exchange their goods and services directly without any medium of exchange and since this system was costly and inefficient each society innovated something which could be used as a medium of exchange. On the basis of necessity as the *mother of invention*, the need for money aroused from such problems. For instance in America before the Revolutionary war, money might have primarily consisted of Spanish doubloons (silver coins that were also called pieces of eight).

Before the American Civil War (1861-1865) the principal forms of money in the United States were not only gold and silver coins but also paper notes (banknotes) issued by private banks. Salt (so called *Amole*) in Ethiopia and animal skins and furs in the cold regions of Alaska and Siberia have served as money for a number of years.

Today we use money issued by governments. In general money has been different things at different times; however it has always been important to people and to the economy. Ultimately to understand the effects of money on the economy, we must understand exactly what money is.

As the word money is used in everyday conversation, it can mean many things but to economists it has a very specific meaning.

Economists define money (also referred to as the money supply) as anything that is generally accepted in payment for goods and services or in the repayment of debts.



If a gangster comes up to you and says, “your money or your life” would you ask him, “what exactly do you mean by money?”

To define money merely as currency is much too narrow for economists. Because cheques are also accepted as payment for purchases; checking account deposits are considered money as

well. As you can see, there is no single, precise definition of money or the money supply, even for economists. For example, money has a Functional definition, an Empirical definition, etc...

- ❖ Money is a standard of deferred (postponed) payments. E.g. Interest, rent, pension, insurance ... It is used to decide the amount to be paid in future.
- ❖ Money can be used as a store of value. This arises from the time gap between receipts and payments; i.e. there is a gap between the time of buying and the time of selling.

The one essential characteristic which money has is this: It is immediately exchangeable for all other kinds of marketable assets-goods and services, real estate, stocks and bonds or whatever. i.e. money is the **most liquid asset** (or money has liquidity advantage).

The term liquidity refers to the ease with which an asset can be exchanged for other assets. A highly liquid asset is one which can be exchanged for other assets (or for money), quickly, and without loss of value. Different assets (houses, cars, government bonds, etc) have different degrees of liquidity. But money is the only asset that has perfect liquidity.



What is money made of? How does it look? Does it matter?

It makes no difference. As long as it is performing the functions of money-as long as it is being used as a generally accepted medium of exchange- it is money.

1.1.2. The Inefficiency of Barter System and the Microeconomic (Efficient-Resource- Allocating) Role of Money

It is intuitively obvious that exchange without the use of money would not be very efficient. Barter requires a double coincidence of wants. Each of us must find someone else who both wants the goods we have and has the goods we want. Thus, the transaction cost mainly in the form of search cost will be high and hence it makes specialization unattractive and hence people will tend to be self-sufficient in their production which will make them inefficient.

The existence of an efficient Medium of exchange (money) is essential to permit each of us to specialize in what we are relatively most efficient in producing-that is, our “comparative advantage” product-and then to exchange that product for the other things we want. Money is essential in the efficient functioning of markets and the price mechanism.

In its microeconomic role, money permits the society to achieve a more efficient allocation of resources. Money facilitates the flow of resources in to their most efficient uses. The ultimate result is increased efficiency of the economy and increased economics welfare for the society.

With specialization we can all become more efficient and enjoy higher standard of living. And savings can flow smoothly- directly or through financial intermediaries-in to investment. The high productivity of the modern world could not exist without a high degree of specialization. And all this specialization could not exist without money.

1.1.3. Functions of Money

Money is essential in the efficient functioning of markets and the price mechanism. Various functions of money can be classifies in to three broad groups:

- a) Primary functions
- b) Secondary functions
- c) Contingent functions.

a) Primary functions

The primary function of money includes the role money plays as a medium of exchange and measure of value.

i) *Medium of Exchange:* - The most basic function of money is to serve as the medium of exchange. In almost all market transactions in our economy, money in the form of currency or checks is a medium of exchange; it is used to pay for goods and services. So money is a commonly acceptable medium of exchange – because it is a legal tender. In the barter system, the exchange is commodity -to- commodity. But in the financial system, the exchange is commodity -to- money -to- commodity. That is why money is taken as the medium of exchange.

Money has no power to satisfy human wants directly, it commands power to purchase those things which have utility and satisfy human wants. The use of money as a medium of exchange promotes economic efficiency by

- Eliminating much of the time spent exchanging goods and service.
- Allowing people to specialize in what they do best

- Avoiding the problem of double coincidence by decomposing the single transaction of barter in to two separate transactions of sale & purchase
- Allowing freedom of choice

Money is therefore a lubricant that allows the economy to run more smoothly by lowering transaction cost, thereby encouraging specialization and the division of labor. However, the acceptance of money as a medium of exchange is a matter of social convention. Each person accepts money as a means of payment because he/she is confident that others will accept it in payment for him/her. The social convention could either be established through **legal** or other means.

For any commodity to function as money [as medium of exchange], it has to meet some criteria

- **Standardization** – it must be easily standardized, making it simple to ascertain its value.
- **It must be widely accepted**
- **Divisibility** – It must be divisible so that it is easy to make a change
- **Portability** – it must be easy to carry
- **Durability** – it must not deteriorate quickly

ii) **Unit of Account:** - here money is used to measure value in the economy. We measure the value of goods and services in terms of money. Money as a unit of account reduces transaction costs in an economy by reducing the number of prices that need to be considered. We measure the value of goods and services in terms of money just as we measure weight in terms of pounds or distance in terms of miles.

To see why this function is important, let's look at a barter economy where money does not perform this function. If the economy has only three goods: say food, shelter, and clothes, then we need to know only three prices to tell us how to exchange one for another: the price of food in terms of shelter (that is, how many sheltering services the economic agent has to pay for a unit of food), the price of food in terms of clothes, and the price of shelter in terms of clothes. If there were ten goods, we would need to know 45 prices in order to exchange one good for another; and with 1,000 goods we would need 499,500 prices. The formula for telling us the number of prices we need when we have N goods is the same formula that tells us the number of pairs when there are N items. It is

$$\frac{N(N - 1)}{2}$$

Imagine how hard it would be to shop in a supermarket with 1000 different items on its shelves to make sure that you can compare the prices of all items, the price tags of each item would have to list up to 999 different prices, and the time spent reading them would result in very high transaction cost. The solution to the problem is to introduce money in to the economy and have all prices quoted in terms of units of that money, enabling us to quote the price of shelter, food and clothes in terms of, say, dollars (or Birr) .

If there were only three goods in the economy, this would not be a great advantage over the barter system because we would still need three prices to conduct transactions. But for ten goods we now need only ten prices; for 100 goods, 100 prices; and so on. At the 1000 – good supermarket, there are now only 1000 prices to look at, not 499, 500.

Money is a measure of value. Value can be value in use (utility) or value in exchange (price). The price of a commodity may not necessarily depend on the utility of the commodity and rather on its scarcity (**Water- gold paradox**).

Money is the yardstick to measure the value of each commodity in the economy. It is one thing that measures everything. It has made the exchange system very simple. The accounting system has also become very familiar and so simple.

One problem with money acting as a measure of value is that its own value is not constant (unstable). The value of money equals to the price level in the economy, and prices are not that much stable. As the price of commodities increases, the value of money decreases and vice versa. The value of money depreciates at the time of inflation and appreciates at the time of deflation.

NB: This benefit of money grows as the economy becomes more complex.

b) Secondary functions

The secondary functions of money include its role as a store of value, deferred payments and transfer of value.

i) Store of Value (wealth holding): - Money also functions as a store of value is a repository of purchasing power over time. Money is used to save purchasing power from the time income is received until the time it is spent. This function of money is useful because most of us do not want to spend our income immediately up on receiving it but rather prefer to wait until we have the time or the desire to shop.

Money is not unique as a store of value; any asset, be it money, stocks, bonds, land, houses, art, or jewelry, can be used to store wealth. Many such assets have advantage over money as a store of value: they often pay the owner a higher interest rather than money, experience price appreciation and provide service as a house.

? If these assets are a more desirable store of value than money, why do people hold money at all?

The answer to this question relates to the important economic concept of liquidity, the relative ease and speed with which an asset can be converted in to a medium of exchange. Hence money is the most liquid asset of all because it is the medium of exchange it does not have to be converted. In to anything else to make purchases other assets however, involve transaction costs when they are converted in to money.

The importance of money as a store of value depends on the rate of increase of the general price level as compared to urgency for liquidity.

? What would you recommend if your friend tell you that he is going to save his money at a time of hyper-inflation?

For example, if inflation doubles, the value of money halves. The following formula provides the relationship between the value of money (VM) and inflation rate (π).

$$VM = \frac{1}{1 + \pi}$$

When π increases by 100%

$$VM = \frac{1}{1 + 100/100} = \frac{1}{2} = 50\%$$

Thus, doubling of all prices means that the value of money has dropped by half.

This function of money may not be vital if the economy is hit by hyperinflation. You can consider the case of Germany at the end of WWI and very recently Zimbabwe were hit by hyperinflation which results in the significant loss of trust on money as a store of value.

ii) Money as a standard of deferred payments

Money lets you buy now and pay later. Or it lets you lend now and collect later. When people save money, that money can be borrowed and channeled in to investments- it is the deferred payments function of money which permits this transfer of spending power from earner – savers to borrower – spenders. It permits the easy transfer of resources out of their less desired (less productive less profitable) uses and in to their more desired (more productive, more profitable) uses.

But for money to become a satisfactory standard of deferred payments, it must maintain a constant value through time. If its value increases through time (i.e during the period of falling price level), it benefits the creditors at the cost of debtors and if its value falls (i.e during the period of rising price level), it benefits the debtors at the cost of creditors.



Dear learner! If you are a money lender in the rural area, do you provide large sum of credit to the debtor at the time of rising inflation? Why?

iii) Money as a transfer of value

Through money value can be easily and quickly transferred from one place to the other. For example it is much easier to transfer 3,000 birr through bank from Mr. X to Y than remitting the same value in commodity terms say wheat.

c) Contingent functions

This function of money includes money's role in distribution of national income and maximization of satisfaction.

i) Distribution of national income

Money facilitates the division of national income between people. Total output of the country is jointly produced by a number of people as workers, land owners, capitalists and entrepreneurs which in turn should be redistributed among them. Money helps in the distribution of national product in the form of wage, rent, interest and profit.

ii) Maximization of satisfaction

Money helps consumers and producers to maximize their benefits. A consumer maximizes his/her satisfaction by equating the price of each commodity (expressed in terms of money) with its marginal utility. Similarly, a producer maximizes his/her profit by equating marginal productivity of a factor with its price.

The primary function of money as name indicates plays a major role in the economy where as the secondary benefits of money even though they are important to the economy, these roles of money can also be entertained if other assets are used. The contingent functions of money are least important as compared to the other functions.

1.2. Forms of Money

Basically we have three kinds of money: Coins/metallic money, paper money, and deposits.

- a) **Coins:** - these have both intrinsic value and face value. Intrinsic value of coins is the value of the metal inside the coin. As long as the intrinsic value of the coin is less than or equal to the face value of the coin, there will not be a problem.

 **What will happen if the intrinsic value of the coin is better than its face value?**

However, if the intrinsic value of the coin is better than its face value, it will gradually disappear from the market (circulation), because people could melt the coins and use them for ornamental and other purposes. If the intrinsic value of the coin is equal to its face value, we call it **full-bodied money** or representative money. **Token money** is a one whose face value of the coin is better than its intrinsic value. These days this type of money is more common in circulation.

- b) **Paper Money:** - this does not have any intrinsic value. It is a legal tender issued by government bodies which, at least in local markets, is acceptable for transactions purpose.

Paper currencies are of two types: *convertible* and *inconvertible*. A paper money is called as **convertible** if it is easily convertible to precious metals such as gold and silver. A paper money is **inconvertible** if it is convertible only to other forms of currencies such as the Euro, Yen, Dollar or Pound Sterling. Currencies can also be defined as *limited* or *unlimited*. **Limited currencies** refer to those legal tenders (currencies) which can be used as medium of exchange only for

limited purposes. Example: coins- they are used for small payments and are not used to settle debts. **Unlimited currencies** are currencies used for all types of transactions.

Seignorage: It refers to the difference between the face value of money and its cost of production. In case where the difference is positive, it yields a sort of real gain to the issuing part (government bodies). But these agents have to consider the social acceptability of the issued currencies.

c) Deposits: - these are accounts at a bank that entitle their owners different privileges depending on the account's specific behavior. Commonly speaking, we have three types of deposits:

- ❖ Demand deposits;
- ❖ Saving deposits and
- ❖ Time deposits.

Demand Deposits (DD): these are also called *non- interest bearing* checking accounts. They are accounts that are payable on demand; i.e. if a depositor shows up at the bank and requests payment by making a withdrawal, the bank must pay the depositor immediately. These deposit types can also act as asset. Usually, their basic advantage is that they are highly liquid.

Saving Deposits (SD): the aim of these accounts is to encourage and mobilize small savings of the public. Certain restrictions are imposed on the depositors regarding the number of withdrawals and the amount to be withdrawn in a given period. A rate of interest is paid on them but it is less than the reward of the same in time deposits.

Time Deposits (TD): these are fixed deposits- the money is deposited for some fixed period of time so that the depositor would be unable to withdraw it unless the duration stated is fulfilled. Banks have the advantage in issuing time deposits in that they can utilize the money deposited for other purposes until the date of withdrawal. Similarly the owners of such deposits have the privileges of earning interest income on their deposits. These deposits are short of liquidity; i.e. the moneyness is less; and this creates some cost of inconvenience.

Depending on the level of liquidity, we can classify money into 4 categories: M1, M2, M3, and M4.

- ✚ **M1:-** is defined as $M1 = C + DD$; i.e. it is the sum of currency and demand deposits. It is taken as the most liquid money. This is the narrow definition of money, and hence M1 is called **narrow money**.
- ✚ **M2:-** is defined as $M2 = C + DD + SD$; i. e. they are not actually money but are used in markets as money substitutes. They do have a good deal of liquidity.
- ✚ **M3:-** is defined as $M3 = C + DD + SD + TD$; Here the existence of TD makes M3 less liquid as compared to M1 and M2. But since M3 contains TD, it is a broad measure of money- hence called **broad money**. It is also called *Aggregate Monetary Resource (AMR)*.
- ✚ **M4:-** is defined as $M4 = M3 + \text{bonds} + \text{shares} + \text{other assets}$. It is the least liquid money type.

Just for the sake of comparison between narrow money (M1) and broad money (M3): while the former is more liquid, non-interest bearing, and is used commonly as a medium of exchange; the latter is less liquid but interest bearing, and is used in most of the cases as a store of value.

It is difficult to know the type of money (M1, M2, M3, or M4) that is commonly used in order to report the supply of money in one country. Because we cannot be sure which of the monetary aggregates is the true measure of money. It is logical to wonder if their movements closely parallel one another. If they do, then using one monetary aggregate to predict future economic performance and to conduct policy will be the same as using another, and it does not matter much that we are not sure of the appropriate definition of money for a given policy decision. However, if the monetary aggregates do not move together, then what one monetary aggregate tells us might be quite different from what another monetary aggregate would tell us. The conflicting stories might present a confusing picture that would make it hard for policymakers to decide on the right course of action.

1.3. Measurement of money Supply

The definition of money as anything that is generally accepted in payment for goods and services tells us that money is defined by people's behavior. What makes asset money is that people believe it will be accepted by others when making payment.

To measure money, we need a precise definition that tells us exactly what assets should be included. There are two ways of obtaining a precise definition of money.

- i) Theoretical approach, and
- ii) Empirical approach

The theoretical approach defines money by using economic theory to decide which assets should be included in its measure. As we have seen, the key feature of money is that it is used as a medium of exchange. Therefore, the theoretical approach focuses on this aspect and suggests that only assets that clearly serve as a medium of exchange belong in a measure of the money supply. Currency, checking account deposits, and traveler's checks can all be used to pay for goods and services and clearly function as a medium of exchange. The theoretical approach suggests that a measure of the money supply should include only these assets.

Unfortunately, the theoretical approach is not as clear – cut as we would like. Other assets function like a medium of exchange but are not quite as liquid as currency and checking account deposits.

The ambiguities inherent in the theoretical approach in determining which assets should be included in a measure of money have led many economists to suggest that money should be defined with a more empirical approach; that is, the decision about what to call money should be based on which measure of money works best in predicting movements of variables that money is supposed to explain.

Money is something which is very difficult to define since it belongs to the category of things which are not amenable to any single definition. It is so partly because it performs more than three functions in the economy. It is, therefore, easier to understand what money consists of than to give any universally accepted definition of money. Broadly there are four important approaches to the definition of money.

- i) Conventional approach
- ii) Chicago approach
- iii) Gurley and Shaw approach
- iv) Central bank approach

i) The Conventional Approach

This is the oldest approach. According to this the most important function of money in society is to act as a medium of exchange. Money is what it uniquely does. Keynes defined money as “that by delivery of which debt contracts and price contracts are discharged and in the shape of which general purchasing power is held”. The types of assets that satisfy these criteria are

- a) Currency (c)
- b) Demand deposits in commercial banks (DD)

Thus according to the conventional definition $M = C + DD$, this is the narrow definition of money. It excludes time deposits in the commercial banks because such deposits must first be converted in to either currency or demand deposits before they can be spent.

Note that demand deposits are deposits payable on demand through cheque or otherwise. It is important to note that among deposits it is only demand deposits which serve as a medium of exchange,

ii) The Chicago approach

The Chicago economists led by Professor Milton Friedman adopted a broader definition of money by defining it more broadly as “a temporary abode of purchasing power”. Their argument is that since in the economy money income and spending flow streams are not perfectly synchronized in time in order to function as a medium of exchange, money should be temporarily stored as a general purchasing power. This could be in the form of currency, demand deposits or time deposits (including saving deposits).

$$M2 = C + DD + SD + TD,$$

Where: C – Currency, SD – Saving deposits, DD – Demand deposits (Checking deposits), TD – Time deposits

The Chicago economist advanced two reasons for including time and saving deposits in the definition of money.

- a) National income is more highly correlated with money that includes saving and time deposits than money narrowly defined.

- b) According to economic theory, perfect or near perfect substitutes of a commodity should be included in the definition of a single commodity. According to Chicago economist time deposits (deposits which are not payable on demand and on which cheques can't be drawn) are very close substitutes for currency and demand deposits.

iii) Gurley and Shaw approach

This approach is associated with the names of Professor John G. Gurley and Edwards Shaw. According to these economists there exists a fairly large spectrum of financial assets which are close substitutes for money. They emphasized the close substitution relationship between currency, demand deposits, commercial deposits, saving deposits, credit issued by credit institution, shares, government bonds etc. all of which are regarded as alternative liquid stores of value by the public.

A rapid growth of deposits held by non – bank financial institutions (n.b.f.is) has increased their practical importance as a source of credit.

$$M = C + DD + SD + TD + \text{non-clearing bank deposits} + \text{n.b.f.i deposits.}$$

The definition includes all deposits of and the claims of all types of financial intermediaries. It assigns weights to each asset in the definition of money to come up with the total supply of money. That is assignment of weights according to the degree of substitution. For instance it gives a weight of one to currency and demand deposits as they are perfect substitutes and zero to houses which are imperfect substitute's weights such as 0.25, 0.5, 0.75, 0.8, etc would be assigned to different assets according to the degree of substitution.

Theoretically this approach is superior to the Chicago which assigns equal weights to all items in the definition of money ranging from currency to time deposits. However practically it is difficult to implement it.

iv) The central bank approach (Radcliff committee)

This approach, which has been favored by the commercial bank authorities, take the widest possible view of money. It defines money as

$$M = C + DD + SD + TD + \text{non-clearing bank deposits} + \text{n.b. \Üi deposits} + \text{credit lines.}$$

Money is identified with the credit extended by various sources. The reason for identifying money with credit used in the broadest possible sense of the term lies in the central banks historic position that “total credit availability constitutes the key variable for regulating the economy.

In general two pragmatic means could be used to define the money supply of a particular country.

- a) The definition utilized should depend on the particular problem being studied. Example: if an analysis of the effect of the money supply on economic activity is being undertaken, the appropriate definition of money supply is the one that provides the best statistical results. If m_1 is statistically predictable than m_2 , monetary policy should be couched in terms of that narrow definition.
- b) A method of identifying a break in the spectrum of assets to separate money. If the substitutability b/n DD and TD is lower than that between TD and other liquid assets, then the definition of money should be limited to currency and demand deposits.

1.4. Evolution of the payment system



Dear learner! Have you ever imagined how the payment system has evolved through time?

History shows that the payment system has evolved from the use of precious metals to the use of paper money and cheques and now days to the use of electronic system of payment. The payments system has been evolving over centuries and with it the form of money has also changed.

When the barter system was replaced by monetary system, the primitive money first used was commodity money. And the choice of particular commodity to be used as money was determined by factors such as: location of the community, climate, culture, economic development etc... of the community.

The problem with a payments system based exclusively on commodity money is that such a form of money is very heavy and is hard to transport from one place to another. Imagine the holes you would wear in your pockets if you had to buy things only with precious metals.

In deed for large purchases such as a house, you would have to rent a truck to transport the money for payment!

The next development in the payment system was paper currency (pieces of paper that function as a medium of exchange). Initially, paper currency embodied a promise that it was convertible in to coins or in to a quantity of precious metal. In most of the countries, however, currency has evolved in to fiat money, paper currency decreed by governments as legal tender (meaning that legally it must be accepted as payment for debts) but not convertible in to coins or precious metal.

Paper currency has the advantage of being much lighter than coins or precious metal, but it can be accepted as a medium of exchange only if there is some trust in the authorities who issue it and printing has reached a sufficiently advanced stage that counterfeiting is extremely difficult.

Major drawbacks of paper currency are that it can be easily stolen and also expensive to transport if there are very large payments. To combat this problem another step in the evolution of the payment system occurred with the development of modern banking: the invention of cheques. In this case, someone will have a checking account at a bank and can write cheques whenever he wants to make some payment and the holder of the cheque can cash it at a bank.

Cheques are payable on demand that allows transaction to take place without the need to carry around large amounts of currency. The introduction of cheques was a major innovation and radical change that improved the efficiency of the payment system in the economy. Frequently, payments made back and forth cancel each-other; without cheques, this would involve the movement of a lot of currency. The use of cheques, thus, reduces the transportation costs associated with the payment system and improves economic efficiency. Another advantage of cheques is that they can be written for any amount up to the balance in the account, making transaction for large amounts much easier. Cheques are advantageous in that loss from theft is highly reduced, and they provide convenient receipts for purchases.

There are, however, two problems with a payments system based on cheques. First, it takes time to get cheques from one place to another, particularly serious problem if you are paying someone in a different location who needs to be paid quickly. In addition, if you have a checking account, you know that it takes several business days before a bank will allow you to make use of the funds from a cheque that you have deposited.

In order to cope with the problem of cheques what has been introduced as a payment system is electronic money. The development of computers and the spread of the internet now make it cheap to pay bills electronically in developed countries. In the past, you had to pay your bills by mailing a cheque, but now banks provide a web site in which you just log in, make a few clicks, and thereby transmit your payment electronically. Not only do you save the cost of the stamp, but paying bills becomes (almost) a pleasure, requiring little effort. Electronic payment systems provided by banks now even spare you the step of logging on to pay the bill. Instead, recurring bills can be automatically deducted from your bank account. Electronic payments technology can not only substitute for cheques, but can substitute for cash.

Given the convenience of e-money, you might think that we would move quickly to the cashless society in which all payments were made electronically. However, this hasn't happened. You can count your friends who have Visa-cards from any of the commercial banks in Ethiopia. Really they are few. Why? The wide usage of e-money requires ATM machines, computers...etc which are expensive for the majority of the world. Moreover, e-money is highly prone to computer hackers which may result in loss of our money stored.

1.5. The Evolution of Money and the Payment System in Ethiopia

According to official records it was since the third century A.D (during the reign of King Endybis and Aphilas) that Axumite kingdom was using its own coins for both internal and external trading, although coins might have existed many years before. With the fall of the kingdom, however, the coins were disappeared from circulation and since then, in Ethiopia, various commodities like a bar of salt (amole), cloth, beads etc had been used as money.

The most important and widely spread one, however, was the salt. Until, the emergence of Maria Theresa, salt was the most popular medium of exchange. Even after the introduction of Maria Theresa in to Ethiopia salt continued to exist as one of the popular medium of exchange. In

addition to the commodity money, metallic money like Maria Theresa, the coins of Menelik II, Haileselassie I, the Lire, the East African shilling, and the present type of coins have been serving as medium of exchange before a modern money came in to being.

The Maria Theresa Thaler has had a long history in Ethiopia and had important place in the monetary evolution of the country. The coin was first minted in Vienna in 1751 to commemorate the coronation of Maria Theresa as empress of Austria. Interestingly enough this coin was not used as a legal currency in its country of origin. It is believed that Maria Theresa was introduced into Ethiopia by traders between the late 18th and early 19th century. Maria Theresa served a medium of exchange until 1945. Although it was not as popular as Maria Theresa, the first national coin was minted by Emperor Menelik II, in 1893. Menelik's coins were replaced by the new metallic coins issued in July 1933 bearing the image of Emperor Haileselassie.

Paper money was issued by the bank of Abyssinia for the first time in 1914. But, it was strange to the society and it failed to get acceptance since the people were familiar only with the metallic coins. Paper money was again issued by the bank of Ethiopia (the successor of the Bank of Abyssinia) in 1932. These notes were 100 percent backed by gold deposits and hence were being used as a medium of exchange along with the salt bar and the Maria Theresa until the interruption by the Italian occupation of 1936.

In 1941 when the country was liberated from the brief Italian occupation it had no national currency and financial institutions. Following the restoration of independence in 1941, many foreign currency started to be used as medium of exchange including Italian Lire, the Maria Theresa Dollar, the east African Shilling, the Indian Rupee, and the Egyptian Pound circulating as medium of exchange. While the Lire was a relic of the Italian occupation and the Maria Theresa Dollar a carry-over from earlier periods, the rest of the currencies were introduced by the British military forces who helped liberate the country and assumed responsibility in its administration.

It was only in July 1945 that the Ethiopian government issued the new national currency-Birr. With the development of the banking system cheques also started to be used as money. E-money has not been widely introduced in to the economy as yet (though there are some developments in that regard in recent years).

Chapter- One: Review Questions

Part I: Choose the best answer from the given alternatives

- 1) Which one of the following is necessarily not true about barter system?
 - A) It was costly and inefficient system
 - B) In this system there is a gap between the time of buying and the time of selling
 - C) In this system we cannot make a postponed payment
 - D) It makes specialization unattractive
 - E) All of the above
- 2) Which one of the following assets is the least liquid as compared to the others?
 - A) Paper money
 - C) Time deposits
 - E) Bond
 - B) Demand deposits
 - D) Saving deposits
- 3) If there are 80 commodities in the market for an economy, the number of prices that should be fixed in barter and money system respectively are
 - A) 6,400 and 80
 - C) 3,160 and 80
 - B) 6,320 and 80
 - D) 80 and 79
 - E) None of the above
- 4) When people save money, that money can be borrowed and channeled in to investments- it is
 - A) A function of money as a transfer of values
 - B) A function of money as a store of value
 - C) A function of money as a medium of exchange
 - D) A function of money as facilitates the division of national income
 - E) A function of money as a deferred payment
- 5) Which approach argued the existence of a fairly large spectrum of financial assets which are close substitutes for money
 - A) Conventional approach
 - D) Chicago approach
 - B) Gurley and Shaw approach
 - E) All of the above
 - C) Central bank approach
- 6) Which one of the following is true about money
 - A) Money is not the only asset that has perfect liquidity
 - B) Money has a power to satisfy human wants directly

- Part II: Give the appropriate answer for the following questions.**

- Page 20

CHAPTER TWO

AN OVERVIEW OF THE FINANCIAL SYSTEM

Introduction

Financial markets (like bond and stock markets) and financial intermediaries (banks, insurance companies, pension funds) have the basic function of getting people together by moving funds from those who have a surplus of funds to those who have a shortage of funds. More realistically, when a firm plans an expansion work, it may need funds to bring it to market. Similarly, when a government needs to build a road or a school, it may need more funds than it gets from its different revenue sources. Well-function financial markets and financial intermediaries are needed to improve economic well-being and efficiency and are crucial to economic health.

Dear learner! To study the effects of financial markets and financial intermediaries on the economy, we must first acquire an understanding of their general structure and operation. This chapter presents an overview of the fascinating study of financial markets and institutions. Specifically, in this chapter we learn about

- ✓ The major functions of financial markets as well as how these markets are regulated.
- ✓ structure of financial markets
- ✓ Financial intermediaries and their functions, Transaction costs, Asymmetric information, Moral hazard
- ✓ Ensuring of sound financial management and
- ✓ The link between financial development and economic growth

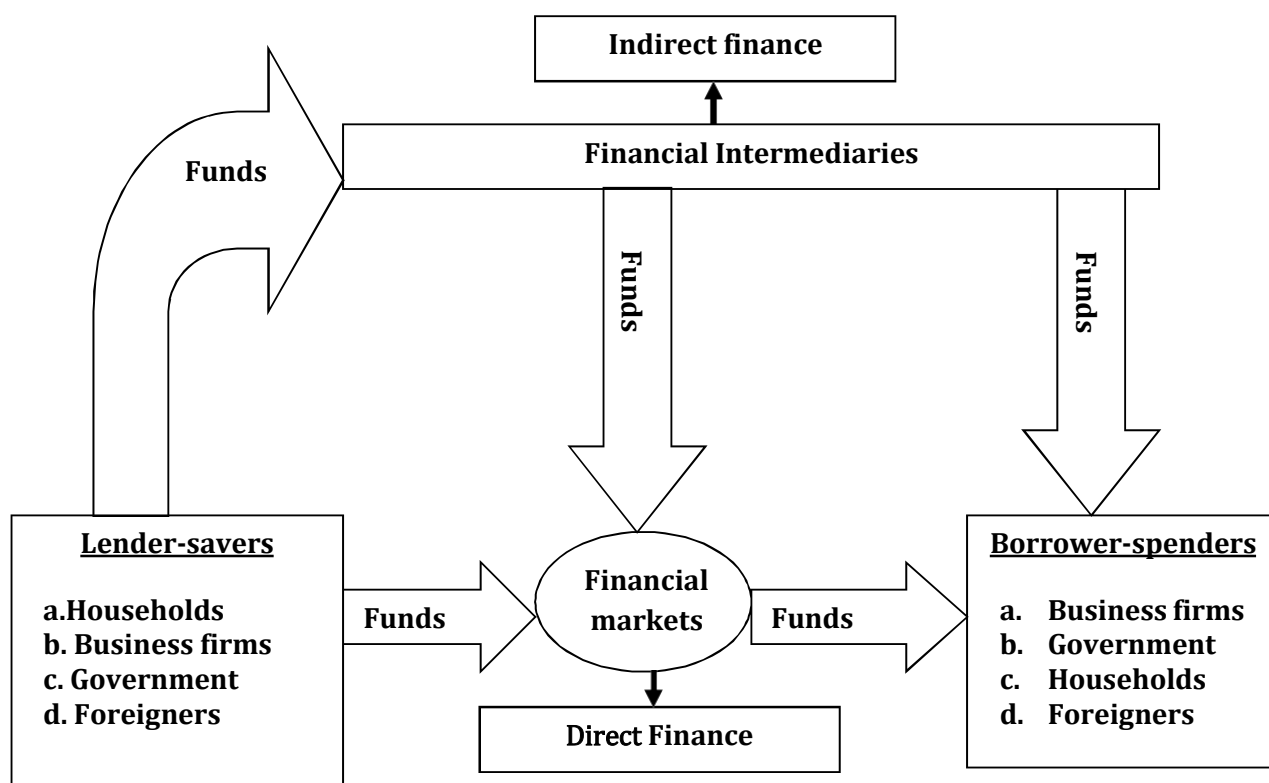
2.1. Functions and Importance of the Financial System

Financial system is a set of financial institutions and financial instruments which provide linkages between the surplus agents and the deficit agents in the economy, given certain rules and regulations governing the linkages.

Financial markets perform the essential economic function of channeling funds from people who have saved surplus funds by spending less than their income to people who have a shortage of funds because they wish to spend more than their income.

This function is shown schematically below. Those who have saved and are lending funds, the lender-savers, are at the left, and those who must borrow funds to finance their spending, the spending, borrower-spends, at the right.

Fig. 2.1 The flow of funds through the financial system



In a given economy the principal lenders – savers are households, but business enterprises and the government as well as foreigners and their government, sometimes also find themselves with excess funds and so lend them out. The most important borrower – spenders are businesses and the government but household and foreigners also borrow to finance their purchases especially of consumer durables. The arrows show that funds flow from lender – savers to borrower – spenders via two routes.

In **a direct route/finance** (the route at the bottom of the figure), borrowers borrow funds directly from lenders in financial markets by selling their securities (also called financial instruments- we will discuss them later), which are claims on the borrower's future income or assets. Securities are assets for the person who buys them but liabilities (debts) for the individual or firm that sells (issues) them. For example, if Arba Minch Textile Factory needs to borrow funds to pay for a new plant, it might borrow the funds from a saver by selling the saver a bond- debt security that promises to make payments periodically for a specified period of time.

In the **indirect route/finance**, financial intermediaries are required to link up the borrowers and lenders in the financial markets. The route involves a financial intermediary that stands between the lender-savers and the borrower-spenders and helps the transfer of funds from one to the other. A financial intermediary does this by borrowing funds from the lender-savers and then uses these funds to make loans to borrower-spenders. For example, a bank might acquire funds by issuing a liability to the public in the form of savings deposits. It will then use the funds to acquire an asset by making a loan to a business firm or investor who needs fund. The ultimate result is that funds have been transferred from the public (the lender-savers) to the business firm or the investor (the borrower-spender) with the help of the financial intermediary (the banks and micro finance institutions). Sub-section 2.4 deals with the financial intermediaries in an exhaustive manner.

In the absence of financial markets, the lenders and the borrowers might never get together. Without financial markets, it is hard to transfer funds from a person who has no investment opportunities to one who has promising investment but lacks the finance; they would both be stuck with the status quo, and both would be worse off. Therefore, financial markets are thus essential to promoting economic efficiency.



Why is this channeling of funds from savers to spenders so important to the economy?

The answer is that the people who save are frequently not same people who have profitable investment opportunities available to the entrepreneurs.

Let's first think about this on a personal level. Suppose that you have saved Birr 1000 this year, but no borrowing or lending is possible because there are no financial markets. If you do not have an investment opportunity that will permit you to earn income with your savings, you will

just hold on to the Birr 1000 and will earn no interest. However, another person- a carpenter has a productive use for your 1000 Birr: He can use it to purchase a new tool that will shorten the time it takes him to build a house, thereby earning an extra 200 per year. If you could agree with him, you could lend him the 1000 Birr at interest of Birr 100 per year (10% interest rate), and both of you would be better off. You would earn Birr 100 per year instead of the zero amounts that you would earn otherwise, while he would earn Birr 100 more income per year (the Birr 200 extra earnings per year minus the Birr100 he pays you as a rent for the money you give him). Therefore, in the absence of financial markets, you and the Carpenter might never get together.

The existence of financial markets is also beneficial even if someone borrows for a purpose other than increasing production in a business. Say that you are recently married, have a good job, and want to buy a house. -You earn a good salary, but because you have just started to work, you have not yet saved much. Over time you would have no problem saving enough to buy the house of your dreams, but by then you would be too old to get full enjoyment from it. Without financial markets, you are stuck; you cannot buy the house and will continue to live in your tiny rented room.

If a financial market were set up so that people who had built up savings could lend you the money to buy the house, you would be more than happy to pay them some interest in order to own a home while you are still young enough to enjoy it. Then, when you had saved up enough funds, you would pay back your loan. The overall outcome would be such that you would be better off, as would the persons who made you the loan. They would now earn some interest, whereas they would not if the financial market did not exist.

Now we can see why financial markets have such an important function in the economy. They allow funds to move from people who have productive investment opportunities to people who lack such opportunities. By so doing, financial markets contribute to higher production and efficiency in the overall economy. They also directly improve the well-being of consumers by allowing them to time their purchases better. They provide funds to young people to buy what they need and can eventually afford without forcing them to wait until they have saved up the entire purchase price. Financial markets that are operating efficiently improve the economic welfare of everyone in the society.

2.2. The Structure of Financial Markets

Dear learner! We do have different financial market structures on the bases of the type of financial asset traded, the type of customers involved and the maturity of financial assets. On the bases of the type of financial asset traded we do have debt and equity markets, where as the financial markets can be organized in to primary and secondary markets on the bases of customer involvement. The maturity of financial assets (period of payment) as a division variable results in money and capital markets. Next we discuss in detail about the different structures of financial markets.

A) Debt and Equity Markets: A firm or an individual can obtain funds in a financial market, in two ways. The most common method is to issue a **debt instrument**, such as *a bond or a mortgage*, which is a contractual agreement by the borrower to pay the holder of instrument fixed dollar amounts at regular intervals (interest and principal payments) until a specified date (the maturity date), until a final payment is made. The **maturity** of a debt instrument is the time (term) to that instrument's expiration date. A debt instrument is **short-term** if its maturity is less than a year and **long-term** if its maturity is ten years or longer. Debt instruments with maturity between one and ten years are said to be **intermediate-term**.

The second method of raising funds is by issuing **equities**, such as *common stock*, which are claims to share in the net income (income after expenses - taxes) and the assets of a business. For example, if you own one share of common stock in a company that has issued one million shares, you are entitled to one-millionth of the firm's net income and one- millionth of the firm's assets. Equities usually make periodic payments (**dividends**) to their holders and are considered long-term securities because they have no maturity date.

The main disadvantage of owning a corporation's equities rather than its debt is that an equity holder is a residual claimant; that is, the corporation must pay all its debt holders before it pays its equity holders. In other words, the issuing company pays first the debt holders and then the equity holders. On the other hand, the advantage of holding equities is that equity holders benefit directly from any increases in the corporation's profitability or asset value because equities confer ownership rights on the equity holders. Debt holders do not share in this benefit because their dollar payments are fixed.

Generally, an equity holder is a residual claimant when compared to a debt holder. On the other side of life, an equity holder enjoys any increase in profitability and/or asset values, while a debt holder can enjoy only fixed amount of benefit!

B) Primary and Secondary Markets: The other classification of financial markets is based on the type of customers who involve in the market. **A primary market** is a financial market in which new issues of a security, such as a bond or a stock, are sold to initial buyers by the corporation or government agency borrowing the funds. **A secondary market** is a financial market in which securities that have been previously issued (and are thus secondhand) can be resold.

The primary markets for securities are not well known to the public because the selling of securities to initial buyers takes place behind closed doors. An important financial institution that assists in the initial sale of securities in the primary market is the investment bank. In our country the development bank of Ethiopia is given power to sell a bond to finance the Great Renaissance Dam.

Security brokers and dealers are crucial to a well-functioning secondary market. Brokers are agents of investors who match buyers with sellers of securities; dealers link buyers and sellers by buying and selling securities at stated prices. When an individual buy a security in the secondary market, the person who has sold the security receives money in exchange for the security, but the organization that issued the security acquires no new funds. The organization acquires new funds only when its securities are first sold in the primary market.

Nonetheless secondary markets serve two important functions. First, they make it easier to sell financial instruments to raise cash; that is, they make the financial instruments more liquid. The increased liquidity of these instruments then makes them more desirable and thus easier for the issuing firm to sell in the primary market. Secondly, they determine the price of the security that the issuing firm sells in the primary market. The firms that buy securities in the primary market will pay the issuing corporation no more than the price that they think the secondary market will set for this security. The higher the security's price in the secondary market, the higher will be the price that the issuing firm will receive for a new security in the primary market and hence the greater the amount of capital it can raise. Conditions in the secondary market are therefore the most relevant to organizations issuing securities.

Secondary markets can be organized in two ways. One is to organize exchanges, where buyers and sellers of securities (or their agents or brokers) meet in one central location to conduct trades.

The other method of organizing a secondary market is to have an **over-the-counter (OTC)** market, in which dealers at different locations who have an inventory of securities stand ready to buy and sell securities OTC to anyone who comes to them and is willing to accept their prices. Because OTC dealers are in computer contact and know the prices set by one another, the OTC market is very competitive and not very different from a market with an organized exchange. Good examples of secondary markets include the NYSE (New York Stock Exchange Market), DIW, NASDAQ, XTRA DAX, Paris CAC, KOSPI [I hope that you would familiarize yourself with these abbreviations], and likes.

C) Money and Capital Markets: Another way of distinguishing between markets is on the basis of the maturity of the securities traded in each market. The money market is a financial market in which only short-term instruments (whose maturity is less than one year) are traded. The capital market is the market in which long term debt (whose maturity is one year or greater) and equity instruments are traded.

Money market securities are usually more widely traded than longer-term securities and so tend to be more liquid. In addition, short-term securities have smaller fluctuations in prices than long-term securities, making them safer investments. As a result, corporations and banks actively use this market to earn interest surplus funds that they expect to have only temporarily. Capital market securities such as stocks and long-term bonds are often held by financial intermediaries such as insurance companies and pension funds, which have little uncertainty about the amount of funds they will have available in the future.

2.3. Financial Instruments

Dear learner! To have a comprehensive knowledge about how financial markets run, we need to examine the securities (financial instruments) traded in the market. Although it is obvious that markets for financial instruments are very uncommon in Ethiopia.

Dear learner! In this sub-topic we discuss financial instruments using time as a reference. ‘time’ in this context is the maturity of the financial asset traded. In the above immediate sub-topic we have seen that based on time period, financial instruments are divided into two:

Money market instruments- these are short term instruments with duration of maturity is a year or less. They are used to raise short term funds to buy goods and services in the market.

Capital market instruments- these are medium term and long-term instruments. The basic productivity capacity is embodied in these instruments. Good examples include land and equipment.

Money Market Instruments (short term instruments)

Because of their short terms to maturity, their prices are relatively stable and are the least risky investments. There are two common kinds of money market instruments (although their definitions depend on the structure of the financial market): Bills of Exchange and Inter- Bank Call Money.

Bills: - these are in turn divided into two: Treasury Bills (government bills) and Commercial Bills.

1. Treasury bills: these refer to financial instruments that the government (specifically the ministry of finance) sells in the market to collect money. Governments are tempted to use it whenever there is shortage of money for a short period of time (normally a maximum of a year). They are sold on discount basis; and there is no interest payment to be made on them. They are negotiable. These bills are of two kinds:

- i) **Regular Bills:** - those which are issued on regular basis to collect money, and sold to the general public. It is a continuous process. In our country the government regularly sells treasury bills (*‘Yegmja bet sened’*) to raise fund.
- ii) **Irregular (ad hoc) Bills:** - those bills which are issued for a specific purpose, say for providing investment outlets to state governments. They are not repeated on regular basis. Besides they are not sold to the general public (or are not marketable). In most of the cases they are sold to commercial banks, discount houses, broker agents, and the likes...

2. Commercial Bills: - these are tradable bills issued by the private traders. Eg. Short- term debts issued by General Motors (GM). Here GM is called the **drawer**, while the holders of the

securities (debt in this case) are called the **drawee**. Commercial bills are three- party bills in the sense that a drawer, a drawee and a commercial bank sign on the bill.

Money market instruments benefit one's economy through financing

- ✓ Trade,
- ✓ Industry,
- ✓ Profitable investment and giving a great support to finance budget deficits of the government.

Inter- Bank Call Money: - this refers to the transactions made among banks due to short term deficit and/or surplus. It is an instrument that is transacted in a market among banks where surplus banks are ready to provide liquidity to the deficit banks. It is an accommodation made by banks to one another's requirement. It is over- night cash movement among banks activated by brokers. The brokers (financial mediators) have good deal of information about the liquidity position of each bank and every day. The banks are assumed not to have information on other banks' (rival banks) liquidity position [otherwise the brokers will have no reason to intervene in the market].

The banks make transactions based on interest rates- called *Call Rate*. Among all interest rate types, *call rates* are the most volatile ones. The main function of the call money market is to redistribute the pool of day – to – day surplus funds of banks among other banks in temporally deficit of cash position. For smooth and efficient functioning of the banking system, there must be some institutional arrangements for making the surplus of some banks available to others in temporally deficits. Hence using the call money market, banks will economize their cash and improve their liquidity position. The call money market is highly competitive and sensitive market. It registers very quickly the pressure of demand of and supply for funds operating in the money market.

Capital Market Instruments (long term instruments)

Precisely speaking, capital market instruments are debt and equity instruments with maturities of over one year. They have far wider price fluctuations than money market instruments, and are considered to be fairly risky investments.

A good example is found in the market for stocks, corporate bonds, and mortgages.

- ☞ **Stocks** are equity claims on the net income and assets of a corporation.
- ☞ **Corporate bonds** are long- term bonds issued by corporations with very strong credit ratings.
- ☞ **Mortgages** are loans to individuals or business firms to purchase buildings, land or other real assets where the structure of the asset serves as collateral for the loan.

But, since these securities are very uncommon in a debris country like Ethiopia, it is better for the students and readers to refer to Mishkin (2004) pp 169- 200 to be familiar with the common elements of capital market instruments. I believe that readers should take the initiative to get familiar with this specific topic [as its elements are at most very unfamiliar with the existing environment in the financial markets of Ethiopia- and hence discussing it would add nothing but a bulk of jargon!]

2.4. Financial Intermediaries: Bank and Non-Bank Financial Institutions

2.4.1. Functions of Financial Intermediaries

Dear learner! In this sub section, we would try to reason out why financial intermediaries are more important than security markets for getting funds to borrowers from the lenders. As usual business, we start with definition and gradually substantiate our case with real world examples.

Definition: Financial intermediaries are institutions or firms that mediate or stand between ultimate lenders and ultimate borrowers or between those with budget surplus and those with budget deficit segments of the society.

In modern economies, only a small proportion of savings is directly transferred from the savers to the ultimate borrowers. Most of the savings are directed by the savers to financial intermediaries such as banks, mutual funds, pension funds, insurance companies, microfinance institutions, etc..., which re-channel the funds thus obtained to firms and the government, directly by buying their shares and bonds or indirectly through other financial intermediaries (you can see fig. 2.1 to understand indirect finance easily).

In the earlier chapters, we have agreed that the introduction of money into the economic system has reduced some substantial transaction and information costs. An economic analysis of how these costs affect financial markets provides us the rationale for the importance of financial intermediaries in the financial sector of a given economy.



Why are financial intermediaries and indirect finance so important in financial markets?

Dear learner! To answer this question, we need to understand the role of transaction costs and asymmetric information in financial markets.

i) Transaction Costs: These are costs in terms of time and money spent in carrying out financial transactions. They are the major problems for people who have excess funds to lend. To synthesis the issue, let's reconsider the following example: the Tailor vs. Lender/saver case: The tailor needs Birr 10,000 for his new garment, and you know that it is an excellent investment opportunity. You have the cash and would like to lend him, but to protect your investment, you have to hire a lawyer to write up the loan contract that specifies how much interest he will pay you, when he will make these interest payments, and when he will repay you the Birr 10,000. Suppose, obtaining the contract costs Birr 2000. When you consider the transaction cost for making the loan, you realize that you can't earn enough from the deal (you spend Birr 2,000 to make perhaps Birr 1,000) and reluctantly tell the tailor that he will have to look somewhere else. The above example illustrates that small savers like you or potential borrowers like the tailor might be frozen out of financial markets and thus be unable to benefit each other. Can anyone come to the rescue? Yes! It is the financial intermediaries.

Financial intermediaries can substantially reduce transaction costs because they have developed expertise in lowering them and because their large size allows them to take advantage of economies of scale- the reduction in transaction costs per dollar of transactions as the size (scale) of transactions increases. For example, a bank knows how to find a good lawyer to produce a loan contract, and this contract can be used over and over in its loan transactions, thus lowering the legal cost per transaction.

Because financial intermediaries are able to reduce transaction costs substantially, they make it possible for saver-lenders to provide funds indirectly to people with productive investment opportunities. In addition, low transaction costs mean that financial intermediaries can provide their customers with liquidity services- services that make it easier for customers to conduct transactions. For example, banks provide depositors with checking accounts that enable them to pay their bills easily. In addition, depositors can earn interest on checking and savings accounts and yet convert them into goods and services whenever necessary. The presence of transaction

costs in financial markets explains, in part, why financial intermediaries and indirect finance play such an important role in financial markets.

ii) Asymmetric Information: An additional reason for why the financial market needs financial intermediaries is that in financial markets, one party often does not know enough about the other party to make accurate decisions. This inequality is called asymmetric information. For example, a borrower who takes out a loan usually has better information about the potential returns and risks associated with the investment projects for which the funds are earmarked than the lender does. Lack of information creates problems in the financial system on two fronts: before the transaction is made (Adverse selection) and after the transaction (Moral hazard).

a) Adverse selection: this is the problem created by asymmetric information before the transaction occurs. Adverse selection in financial markets occurs when the potential borrowers are the most likely to produce an undesirable (adverse) outcome. Such borrowers [commonly called credit unworthy borrowers] are the ones who most actively seek out a loan and are thus most likely to be selected.

Because adverse selection makes it more likely that loans might be made to credit unworthy borrowers, lenders may decide not to make any loans even though there are good borrowers (credit worthy borrowers) in the market place. The bad borrowers are usually those who will invest their money in a very profitable but risk investment area, i.e., if their investment happens to be a success they will enjoy huge profit and will pay back their loan with the predetermined return (interest); if they do not succeed and got bankrupt they know that they will not pay anything and hence have nothing to lose. Thus, they will tend to have higher demand. They may, for instance, offer a higher interest rate and hence have higher chance of being selected in the absence of adequate information. The lenders, knowing that there are such bad borrowers (though they cannot tell which ones are), will become less interested in lending their money altogether though they also know that there are some faithful borrowers.

b) Moral hazard: This is a problem created due to asymmetric information after the transaction occurs (loan is disbursed). In financial markets, moral hazard refers to the risk (hazard) that the borrower might engage in activities that are undesirable (immoral) - from the lender's point of view because they make it less likely that the loan will be repaid.

Normally when a loan contract is made, the borrower promises to repay the amount with some extra return. He may also promise that he will use the fund only for some specified purpose. But, once he collects the fund he may be tempted to divert the fund to another investment area which is risky but has higher expected return which is therefore desirable from his point of view. This problem is a serious one for individual lenders since they hardly have the information and the capacity to make sure that the borrower does not divert the fund to some undesirable area of investment. Because moral hazard lowers the probability that the loan will be repaid, lenders may decide that they would rather not make a loan.

Because the concepts of adverse selection and moral hazard are extremely useful in understanding the behavior of financial markets, you must understand them fully. One way to distinguish between them is to remember that adverse selection is a problem of asymmetric information before entering into a transaction, whereas moral hazard is a problem of asymmetric information after the transaction has occurred. In the following paragraph, let's tell you an example you may face in your day to day life (fully adopted from Mishkin (2004)).

The Lemons Problem: How Adverse Selection Influences:

A particular characterization of the adverse selection problem and how it interferes with the efficient functioning of a market was outlined in a famous article by Nobel Prize winner George Akerlof. It is referred to as the “lemons problem,” because it resembles the problem created by lemons in the used-car market. Potential buyers of used cars are frequently unable to assess the quality of the car; that is, they can't tell whether a particular used car is a good car that will run well or a lemon that will continually give them grief. The price that a buyer pays must therefore reflect the *average* quality of the cars in the market, somewhere between the low value of a lemon and the high value of a good car. The owner of a used car, by contrast, is more likely to know whether the car is a peach or a lemon. If the car is a lemon, the owner is more than happy to sell it at the price the buyer is willing to pay, which, being somewhere between the value of a lemon and a good car, is greater than the lemon's value. However, if the car is a peach, the owner knows that the car is undervalued by the price the buyer is willing to pay, and so the owner may not want to sell it. As a result of this adverse selection, very few good used cars will come to the market. Because the average quality of a used car available in the market will be low

and because very few people want to buy a lemon, there will be few sales. The used-car market will then function poorly, if at all.

The problems created by adverse selection and moral hazard are very detrimental to the well-functioning of financial markets. Again, financial intermediaries can alleviate these problems. With financial intermediaries in the economy, small savers can provide the funds to the financial markets by lending these funds to a trustworthy intermediary, say, the commercial banks, which in turn lends the funds out either by making loans or by buying securities such as stocks or bonds to investors. Successful financial intermediaries have higher earnings on their investments because they are better equipped than individuals to screen out faithful borrowers against the unfaithful borrowers, thereby reducing losses due to adverse selection.

In addition, financial intermediary allows high earnings for the lenders, because they develop expertise in monitoring the parties that have borrowed, thus reducing losses due to moral hazard. They can also ask for collateral which is not easy for individual lenders. The result is that financial intermediaries can afford to pay lender-savers interest and/or provide substantial services to both saver-lenders and investor-borrowers and still earn a profit.

One thing you should not forget is that financial intermediaries are not in the business of moving funds from lenders to borrowers for the fun of it. They are in it to get rich. However, concurrently, they improve the lot of savers by providing them with high interest income and help the borrowers by providing them the necessary loans. They work for mutual interest!

In summary, financial intermediaries play key role in improving economic efficiency, because they help financial markets channel funds from lender-savers to people with productive investment opportunities. Without a well-functioning set of financial intermediaries, it is very hard for an economy to reach its full potential. Had there not been for the presence of financial intermediaries, there would have been substantial information costs and transaction costs to conduct the flow of funds from lenders to borrowers.

2.4.2. Types of Financial Intermediaries

Dear learner! In the above discussion, we have seen why financial intermediaries play such an important role in the working of the economy. Now let's look at the principal financial

intermediaries and how they perform the intermediation function. Generally speaking, the financial intermediaries fall into three categories: depository institutions (banks), contractual savings institutions, and investment intermediary's category.

i) Depository institutions

Depository institutions are financial intermediaries that accept deposits from individuals and institutions and make loans. The study of money and banking focuses special attention on this group of financial institutions because they are involved in the creation of deposits, an important component of the money supply. These institutions include commercial banks and the so-called thrift institutions (thrift): savings and loan associations, mutual savings banks, and credit unions. Their behavior plays an important role in determining the money supply.

ii) Contractual Savings Institutions

Contractual Savings Institutions, such as insurance companies and pension funds, are financial intermediaries that acquire funds at periodic intervals on a contractual basis. Because they can predict with reasonable accuracy how much they will have to pay out in benefit in the coming years, they do not have to worry as much as depository institutions about losing funds. As a result, the liquidity of assets is not as important a consideration for them as it is for depository institutions, and they tend to invest their funds primarily in long term securities such as corporate bonds, stocks, and mortgages.

These institutions include life insurance companies, Fire and casualty insurance Companies, and pension funds and government retirement funds.

iii) Investment Intermediaries

This category of financial intermediaries includes Finance companies, mutual funds and money market mutual funds.

Finance Companies: Finance companies raise funds by selling commercial paper (a short-term debt instrument) and by issuing stocks and bonds. They lend these funds to consumers, who make purchases of such items as furniture, automobiles, and home improvements, and to small businesses. Some finance companies are organized by a parent corporation to help sell its product. For example, Ford Motor Credit Company makes loans to consumers who purchase Ford automobiles.

Mutual Funds: These financial intermediaries acquire funds by selling shares to many individuals and use the proceeds to purchase diversified portfolios of stocks and bonds. Mutual funds allow shareholders to pool their resources so that they can take advantage of lower transaction costs when buying large blocks of stocks or bonds. In addition, mutual funds allow shareholders to hold more diversified portfolios than they otherwise would. Shareholders can sell (redeem) shares at any time, but the value of these shares will be determined by the value of the mutual fund's holdings of securities. Because these fluctuate greatly, the value of mutual fund shares will too; therefore, investments in mutual funds can be risky.

Money Market Mutual Funds: These relatively new financial institutions have the characteristics of a mutual fund but also function to some extent as a depository institution because they offer deposit-type accounts. Like most mutual funds, they sell shares to acquire funds that are then used to buy money market instruments that are both safe and very liquid. The interest on these assets is then paid out to the shareholders. A key feature of these funds is that shareholders can write checks against the value of their shareholdings. In effect, shares in a money market mutual fund function like checking account deposits that pay interest.

Till now we have seen about the types and functions of financial markets and intermediaries. What is worth mentioning here is that the financial sector is not totally left for the market to operate. If we allow the financial sector totally to be guided by the market, the world may face frequent financial crisis like the one originated from US in 2008 GC. So the next point that should be raised is how to ensure sound financial management.

2.5. Ensuring Sound Financial Management

Dear learner! Asymmetric information can also lead to widespread collapse of financial intermediaries, referred to as a **financial panic**. Because providers of funds to financial intermediaries may not be able to assess whether the institutions holding their funds are sound, if they have doubts about the overall health of financial intermediaries, they may want to pull their funds out of both sound and unsound institutions. The possible outcome is a financial panic that produces large losses for the public and causes serious damage to the economy. To protect the public and the economy from financial panics and in turn to ensure soundness of financial intermediaries, governments can implement six types of regulations.

- a) **Restrictions on Entry:** State banking and insurance commissions, as well as the agency of federal government can create very tight regulations governing who is allowed to set up a financial intermediary. Individuals or groups that want to establish a financial intermediary, such as a bank or an insurance company, must obtain a charter from the state or the federal government. Only if they are upstanding citizens with impeccable credentials and a large amount of initial funds will they be given a charter. Moreover, the government may increase the initial paid up capital to establish the financial intermediaries which in turn has the capacity of restricting entry by.
- b) **Disclosure:** there should be stringent reporting requirements from financial intermediaries. Their bookkeeping must follow certain strict principles, their books must be subject to periodic inspection, and they must make certain information available to the public.
- c) **Restrictions on Assets and Activities:** there are restrictions on what financial intermediaries are allowed to do and what assets they can hold. Before you put your funds into a bank or some other such institution, you would want to know that your funds are safe and that the bank or other financial intermediary will be able to meet its obligations to you. One way of doing this is to restrict the financial intermediary from engaging in certain risky activities.
- d) **Deposit Insurance:** The government can insure people's deposits so that they do not suffer any financial loss if the financial intermediary that holds these deposits fails.
- e) **Limits on Competition:** Politicians have often declared that unbridled competition among financial intermediaries promotes failures that will harm the public. This may require the limitation of expanding branches without appropriate feasibility studies.
- f) **Restrictions on Interest Rates:** Competition has also been inhibited by regulations that impose restrictions on interest rates that can be paid on deposits.

2.6. Financial Development and Economic Growth

Dear distance learner! Recent research has found that an important reason why many developing countries experience very low rates of growth is that their financial systems are underdeveloped (a situation referred to as *financial repression*). The economic analysis of financial structure helps explain how an underdeveloped financial system leads to a low state of economic development and economic growth.

 ***Dear distance learner! Can you list the major difficulties the faced by developing countries financial systems?***

The financial systems in developing countries face several difficulties that keep them from operating efficiently. As we have seen, two important problems exist in financial market (i.e. moral hazard and adverse selection) which will be solved by collateral and restrictive covenants (agreements).

In many developing countries, the legal system functions poorly, making it hard to make effective use of these two tools. In these countries, bankruptcy procedures are often extremely slow and cumbersome. For example, in many countries, **creditors** (holders of debt) must first sue the defaulting debtor for payment, which can take several years, and then once a favorable judgment has been obtained, the creditor has to sue again to obtain title to the collateral. The process can take in excess of five years, and by the time the lender acquires the collateral, it well may have been neglected and thus have little value.

In addition, governments often block lenders from foreclosing on borrowers in politically powerful sectors such as agriculture. Where the market is unable to use collateral effectively, the adverse selection problem will be worse because the lender will need even more information about the quality of the borrower in order to screen out a good loan from a bad one. The result is that it will be harder for lenders to channel funds to borrowers with the most productive investment opportunities, thereby leading to less productive investment and hence a slower-growing economy. Similarly, a poorly developed legal system may make it extremely difficult for borrowers to enforce restrictive covenants. Thus, they may have a much more limited ability to reduce moral hazard on the part of borrowers and so will be less willing to lend. Again, the outcome will be less productive investment and a lower growth rate for the economy.

Governments in developing countries have also often decided to use their financial systems to direct credit to themselves or to favored sectors of the economy by setting interest rates at artificially low levels for certain types of loans, by creating so-called development finance institutions to make specific types of loans, or by directing existing institutions to lend to certain entities. As we have seen, private institutions have an incentive to solve adverse selection and moral hazard problems and lend to borrowers with the most productive investment opportunities.

Governments have less incentive to do so because they are not driven by the profit motive and so their directed credit programs may not channel funds to sectors that will produce high growth for the economy. The outcome is again likely to result in less efficient investment and slower growth.

In addition, banks in many developing countries have been nationalized by their governments. Again because of the absence of the profit motive, these nationalized banks have little incentive to allocate their capital to the most productive uses. Indeed, the primary loan customer of these nationalized banks is often the government, which does not always use the funds wisely.

We have seen that government regulation can increase the amount of information in financial markets to make them work more efficiently. Many developing countries have an underdeveloped regulatory apparatus that retards the provision of adequate information to the marketplace. For example, developing countries often have weak accounting standards, making it very hard to ascertain the quality of a borrower's balance sheet. As a result, asymmetric information problems are more severe, and the financial system is severely hampered in channeling funds to the most productive uses.

The institutional environment of a poor legal system, weak accounting standards, inadequate government regulation, and government intervention through directed credit programs and nationalization of banks all help explain why many countries stay poor while others grow richer.

Chapter- Two: Review Questions

Part I: Choose the best answer from the given alternatives

- 1) One of the following is **not** necessarily the advantage Ethiopia would benefit from establishing secondary financial market
 - A) Saving mobilization and efficient resource allocation
 - B) Redistribution of wealth to the poor society as a part –owner of profitable enterprises
 - C) Market is working efficiently, fairly and transparently
 - D) **Profiteering Behavior of Intermediaries**
 - E) None of the above

- 2) Sound regulation of financial intermediaries cannot be ensured through
- A) Restriction on new entrants using capital ceilings
 - B) Forcing financial intermediaries to disclose information about their performance
 - C) Giving freedom for financial restriction to choose the type of asset they want to hold
 - D) Limiting competition among financial intermediaries
 - E) None of the above
- 3) One of the following types of financial intermediary different from the other by the source of funds (i.e. primary liabilities)
- A) Commercial banks
 - B) Saving loan associations
 - C) Mutual saving banks
 - D) Mutual funds
 - E) Credit unions
- 4) Which one of the following is **true** about primary financial markets?
- A) They can raise large capital for investment
 - B) They give a signal about the prices of stocks in the secondary market
 - C) They can increase the liquidity of existing financial assets
 - D) They are undertaken in the closed doors
 - E) All of the above
- 5) Which one of the following is **TRUE** about dividends?
- A) It is the most common debt instrument in financial system
 - B) It has maturity date in which final payment is made
 - C) It is a periodic payment of dollars/birrs to the holder of common stocks.
 - D) It is a contractual agreement by the borrower to pay the holder of instrument fixed dollar amounts of interest rate at regular intervals
 - E) None of the above
- 6) Assume **Dashen bank** faces a financial deficit, to overcome this problem it raised funds through overnight cash movement from **Nib International Bank** by financial brokers. Such kind of raising fund is called
- A) Treasury bill
 - B) Commercial bill
 - C) Corporate bond
 - D) Debt instrument
 - E) Inter- Bank Call Money
- 7) Which one of the following is **FALSE** about money market and capital market?
- A) In money market only short-term instruments traded, while in capital market long term debt instruments are traded

- B) Money market securities are usually more widely traded than Capital market securities
 - C) Money market securities have smaller fluctuations in prices than capital market securities
 - D) Capital market instruments are more liquid than money market instruments
 - E) None of the above
- 8) The "lemons problem" exists because of
- A) Asymmetric information.
 - C) Rational expectations.
 - E) Regulation.
 - B) Transactions costs.
 - D) Economies of scale.
- 9) The problem created by asymmetric information before the transaction occurs is called_____, while the problem created after the transaction occurs is called_____.
- A) Moral hazard; adverse selection
 - D) Adverse selection; moral hazard
 - B) Costly state verification; free-riding
 - E) Free-riding; costly state verification
 - C) None of the above
- 10) A common stock is a claim on a corporation's
- A) Earnings and assets.
 - C) Debt.
 - E) Employees.
 - B) Expenses.
 - D) Liabilities.

Part II: Give the appropriate answer for the following questions.

1. “In a world without asymmetric information and transaction costs, financial intermediaries would not exist and they are not as such important.” Do you agree with this statement or not? Explain your answer briefly.
2. If you suspect that a company will go bankrupt next year, which would you rather hold, equities issued by the company or bonds issued by the company? Why?

CHAPTER THREE

THE THEORY OF DEMAND FOR MONEY

Introduction

Dear distance learners! In the first chapter of the module, we have discussed about the definition, function, desirable properties, evolution and measurement of money. In this chapter, our main task will be to deal with the development of different theories of money demand. We will discuss as to how the different theories of demand for money have evolved and the implication of each theory to monetary policies.

 ***Dear distance learner! Why do people hold money? Discuss in the following lines briefly.***

More specifically, we will start by discussing the Classical theories of demand for money (quantity theory of money) developed by Economists such as Irving Fisher and A.C. Pigou. Then, Keynesian theories of money demand will be discussed in detail, and at last Milton Friedman's modern theory of demand for money will be discussed. In the meanwhile, we will have some highlights on related concepts like the motives for holding money, and comparative analysis of different thoughts of the money demand theories.

At the end of this chapter students should be able to

- Explain how the theories of the demand for money have evolved?
- Explain whether or to what extent the quantity of money demanded is affected by changes in interest rates?

3.1. Classical Theories of Money Demand

3.1.1. Quantity Theory of Money

It is a theory mainly discussed by I. Fisher. The quantity theory of money is a theory that discusses how the nominal value of aggregate income is determined. It is also a theory of money demand since it tells us how much money should be hold for a given amount of aggregate income. The theory is based on the concept of velocity of money.

Velocity of Money: It is the rate of turnover of money. It is the average number of times per year that a dollar/Birr is used in buying the total amount of goods and services produced in the economy. It provides the link between money supply and nominal income. Mathematically, it can be given as follows.

$$MV = PY \dots\dots\dots (3.1)$$

Where: V is velocity of money, M is money supply, P is average price level, Y is real level of income or volume of transaction and PY is nominal income

From the above identity we derive the equation for velocity of money as follows:

$$V = \frac{PY \dots\dots\dots}{M} \dots\dots\dots (3.2)$$

According to classicalists, velocity of money depends on institutional and technological factors related to the paying behavior of people. It is therefore assumed to be constant in the short run since institutions and technologies do not change in the short-run. This implies that any change in money supply (M) will be reflected in the nominal income (PY) i.e., if money supply doubles, so will nominal income. Classicalists also assume that the aggregate real income (Y) will remain constant at the equilibrium level in the short-run since prices and wages are completely flexible. Thus, changes in money supply will lead to changes in price only. In other words, an increase in the supply of money leads to an increase in average price level, but everything else (real income, velocity of money etc) will not be affected.

For example, if V and Y are fixed at 4 and 100 respectively, a supply of money (M) which equals 25 implies that the average price level (P) should be 1. And if M doubles to 50, P will also double to 2 while everything else will remain unchanged. This is called **the quantity theory of money** which implies that money is neutral with respect to the real sector of the economy and movements in the price level results solely from changes in the quantity of money.

From the formula of velocity of money given above, we can derive the formula for money holdings or money supply (M) as follows:

$$M = \frac{1}{V} PY \dots\dots\dots (3.3)$$

In equilibrium, the amount of money that people hold (M) will be equal with the quantity of money people demand (quantity of money demand). Thus, we can substitute money demand for money supply in the equation for money supply and then derive the function for money demand. In effect, the quantity theory of money tells us how much money is people hold for a given amount of aggregate income and is a theory of demand for money.

$$M^d = \frac{1}{V} PY = kPY \dots\dots\dots (3.4)$$

Where M^d is quantity of money demanded and k is the reciprocal of velocity while the other symbols are defined as above.

This suggests that money demand is purely a function of nominal income and is not affected by interest rate. Thus, the classicalists' theory of money demand shows that money demand is not a function of interest rate and this is backed by the assumption that people demand money only for transaction purpose. ***For classicalists, money is demanded for transaction purpose only and depends on the volume of transaction and does not depend on interest rate.*** The demand function also tells us that quantity of money demanded is a constant function of nominal income, i.e, people hold a fraction of their nominal income in the form of money.

Criticism of the quantity theory of money

The quantity theory of money developed by Fisher is criticized on the following grounds

- **Interdependence of variables:** the various variables in the transaction equation are not interdependent as assumed by the classical economists. At least theoretically the following relationships can be established:

- A. **M influences V:** as money supply increases, the price increases. Fearing further rise in the price level, people increase their purchase of goods and services which in turn increases the velocity of money.
 - B. **P influences M:** the increase in the level of Price may force governments to increase the rewards of factors of production which is mainly realized through the increase in the money supply.
 - **Unrealistic assumption of full employment:** full employment is a rare phenomenon in the real world. Even in modern capitalist economies, less than full employment and not full employment are the natural features. According to Keynesians, as long as there is unemployment, every increase in the level of money supply may lead to a proportionate increase in output leaving price unchanged.
 - **Ignores other determinants of price level:** according to Fisher, price is determined by only money supply. But in real world a number of factors determine price level.
-  **Try to mention some determinants of price level in addition to money supply.**
- **It rejects the role of interest rate as a determinant of money:** money held on pocket doesn't reward the holders with interest. In contrary to this, bonds and stocks reward the holders with interest and capital gain. Hence, the level of interest rate inversely affects the demand for money which will be discussed in detail when we arrive to Keynesian money demand theory.

3.1.2. The Cambridge Approach to Money Demand

The Cambridge school followed a different approach though they arrived at a similar money demand equation which implies that the quantity of money demanded is given by some proportion of the nominal income. They did not take money demand to be solely affected by volume of transactions or nominal income and velocity. They allow for flexibility in people's decision about money holding instead of being completely bound by institutional and technological factors. As such, it did not rule out the effect of interest rate on the demand for money.

For them, people demand money because it serves as a **medium of exchange** (transaction motive) and as a **store of value**. To the extent that money serves as a medium of exchange,

demand for money is a positive function of the volume of transactions like in the case of the classicalists' quantity theory of demand for money. But, money also serves as a store of value and this part of the demand for money, according to the Cambridge economists, depends on wealth and the relative expected return of money. But, they say that wealth in nominal terms is proportional to nominal income and this suggests that the part of money demanded as a store value is also proportional to nominal income.

The Cambridge approach to money demand equation is given in the following way:

$$M^d = kPY \text{ ----- 3.5}$$

Where k is the proportion of income people desire to hold in money form. The other variables are as represented in above equation. In equation 3.5, PY (nominal income is used as a general proxy for wealth). That is why both the quantity theorists and the Cambridge approach end up with the same equation for money demand.

To conclude, the quantity theory of money and the Cambridge economists developed a classical theory of money demand in which the demand for money is proportional to nominal income. However, the two theories are different in that the first one emphasized technological and institutional factors and ruled out any possible effect of interest rates on the demand for money in the short-run while the Cambridge economists emphasizes individual choice and allows interest rate to affect the demand for money by affecting people's decision to hold money.

3.2. Keynes's Liquidity Preference Theory

Keynes developed a theory of demand that emphasized the importance of interest rates like the Cambridge economists. But his approach is more detailed to the extent that he identified the different motives why people demand money and showed the effect of interest rate on the demand for money in a more explicit way. To address his issue, he started by providing a clear description about why people hold money. He outlined three important reasons for holding money.

1. The transaction demand for money
2. The precautionary demand for money, and
3. The speculative demand for money

1. The transaction demand for money

This relates to the Classical approach of money demand. According to this approach, individuals hold money to carry out day to day transactions. He further extended the issue addressed by Classicalists by relating transaction levels of individuals to their periodic incomes.

In general, we need money to make transactions convenient, easy, comfortable, and regular. The transaction motive for holding money is mainly positive function of income.

$$M^{dt} = f(Y) \text{ ----- 3.6}$$

Where M^{dt} is money demanded for transaction purpose and Y is income.

Marginally, the number of financial institutions and their degree of functionality is negatively related to the transaction motive. The banking habit of a given society also determines the transaction motive of holding money. For example, in countries like Ethiopia (where money has been buried for long), though the Automatic Teller Machine (ATM) is already installed, people are not accustomed to use it frequently.

2. The precautionary demand for money

Like the transaction motive, this motive also refers to demand for money for the purpose of transaction. But, unlike the first motive, here money is not demanded for current transactions and it is rather demanded a caution against unexpected transactions in the future. People could not predict their future volume of transactions and hence their future demand for money and they hold some amount money as a precaution for future and this what Keynes called the precautionary motive for money demand.

People for example, may not be sure about their future health expense and may hold some money for fear that they may face some health problem unexpectedly and need money for treatment. Another example could be expectation about price changes; they may suspect that the prices for some commodities may fall in the future and this will make them hold money so that they will purchase these commodities at better price. For Keynes, this part of the demand for money is primarily dependent on the volume of future expected transactions which in turn is proportional to income like the transaction motive, i.e. as

income increases, people will hold more money for both purposes-current transaction and future expected transactions.

$$M^{dp} = f(Y) \text{-----} 3.7$$

Where M^{dp} is money demanded for precautionary purpose and Y is income.

3. Speculative demand for money

Keynes agreed with the Cambridge economists that money is also demanded as a store of value (wealth) and he called this motive of holding money the *speculative motive*. Though this motive is affected by wealth which in turn is believed to be closely related with income, Keynes also identified interest rate to be an important determinant of this part of money demand. To put it differently, people hold their wealth in different assets and money is one alternative of holding wealth. Therefore, as their wealth increases people will hold more of different assets including money but for the same wealth people may make a substitution between assets based on the relative desirable properties like expected return. Keynes considered money and bond as the two alternative assets of holding money and hence people can hold their wealth either in the form of money or bond and since money does not earn interest, people will choose to hold bond if they expect a positive return from holding bond. Therefore, the speculative motive is inversely affected by interest rate, i.e., as interest rate from bonds increases the return from bonds will increase and people will shift from money to bonds (they will hold less money and more bonds).

$$M^{ds} = f(r) \text{-----} 3.8$$

Where M^{ds} is money demanded for speculative purpose and r is interest rate.

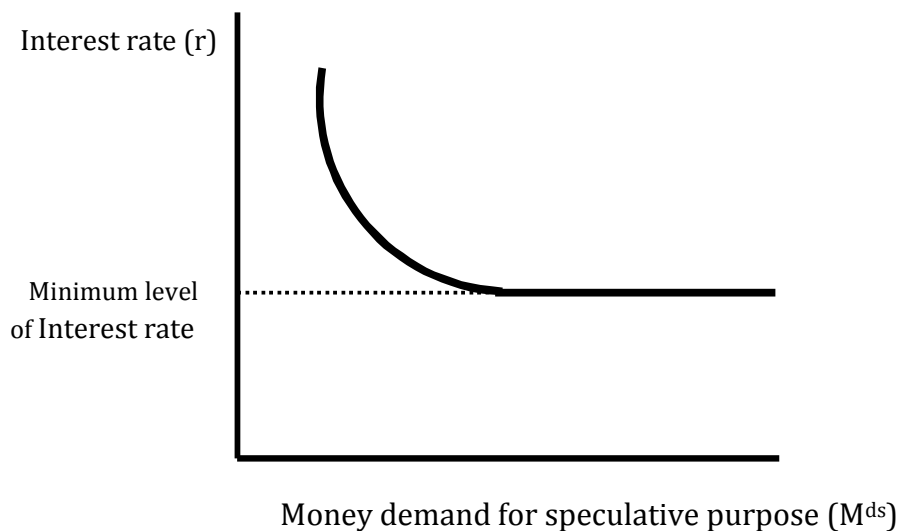
Though Keynes considered only bond as an alternative asset to money in terms of storing wealth, the conclusion can be generalized to the case where there are many alternative assets of storing wealth including different physical & financial assets other than bond.

However, there is a floor level below which interest rate cannot decrease because there are at least minimum costs (transaction costs) that are to be incurred. This yields the **Liquidity Trap**- a situation where everybody holds his/ her asset in money form and expects the interest rate to increase.

? *How do you understand the concept of liquidity trap? Illustrate your response with practical case in the following lines.*

Actually, from monetary policy perspective, liquidity trap is a point where monetary policy is no longer effective in enhancing the performance of the economy. At this point, the demand for money is perfectly elastic. Nobody is prepared to hold bonds (irrespective of their lower prices) and take the risk of expected capital loss. The following figure illustrates the issue at hand.

Figure 3.1. The liquidity trap



If the government increases the level of money supply in case of liquidity trap, it doesn't change the level of interest rate and in turn unable to stimulate the economy. In this situation the only way out is to residue on fiscal policy which uses tax and borrowing as instrument. The fiscal policy concept will be dealt in other course (i.e. fiscal policy Economics/public finance).

Mathematically, one can summarize the above functional relationships (i.e equations from 3.6-3.8) as follows to come up with the total money demand under Keynesian liquidity preference theory.

$$\frac{Md}{e} = f(Y, r) \dots\dots\dots 3.9$$

Where: r is interest rate; Y is real income; M_d is demand for nominal money balances; P is price level; and $\frac{M_d}{P}$ is demand for real money balance

NB: the demand for real money balance as discussed in above is positively related with real income and negatively related with interest rate.

Besides, the fact that money demand is affected by interest rate implies that velocity of money is no longer constant. This is so because money holding changes even without the change in income if interest rate changes. Mathematically, this can be derived from the equation 3.9. By taking the reciprocal of both sides of the above equation, we get the following:

$$\frac{P}{M_d} = \frac{1}{f(i, y)} \dots \dots \dots 3.10$$

Multiplying both sides by 'y' will gives:

$$\frac{Py}{M_d} = \frac{y}{f(i, y)} \dots \dots \dots 3.11$$

But, money demand (M_d) and money supply (M) are equal at equilibrium and hence we can substitute one for the other, thus:

$$\frac{Py}{M} = \frac{y}{f(i, y)} = V \dots \dots \dots 3.12$$

This shows that velocity of money is not constant even in the short run and this is reflected on the real demand for money equation.

In summary, the new idea introduced by Keynes into the analysis of the monetary sector was the liquidity- preference theory- a theory which defined demand for money in terms of the three distinct motives for holding money.

The limitation of Keynes' contribution is that when he built his money demand theory, he restricted his analysis into two assets. It is an either/ or model in the sense that assets were assumed to be either bonds or money.

3.3 Post Keynesian developments in money demand theory: *Baumol – Tobin Theory of Money Demand*

W. Baumol and J. Tobin independently developed very similar demand for money models, which demonstrated that even money balances held for transactions purposes are sensitive to the levels of interest rates. In their model's money, which earns zero interest, is held only because it can be used to carry out transactions. Money is held in transactions balance because it is convenient to do so. But holding transactions balance also involves cost, particularly in income that is forgone by not putting the money held in transactions balances into some form of income- generating investment. This demand for money model is a version of Keynesian model for money demand that modified Keynes' theory. This was done by allowing the transaction motive for money to be affected by interest rate while Keynes argued that the transaction motive for demanding money is solely affected by income.

The Baumol-Tobin model analyses the costs and benefits of holding money. Which is

- ***The benefit of holding money is convenience***; people hold money to avoid making a trip to the bank every time they wish to buy something.
- ***The cost of this convenience is the forgone interest they would have received had they left the money deposited in a savings account that paid interest.***

To see how people, trade off these costs and benefits, consider a person who plans to spend Y dollars gradually over the course of a year. (For simplicity, assume that the price level is constant, so real spending is constant over the year). How much money should he hold in the process of spending this amount? That is, what is the optimal size of average cash balances?

Following Baumol's approach, the demand for money can be analyzed in two stages:

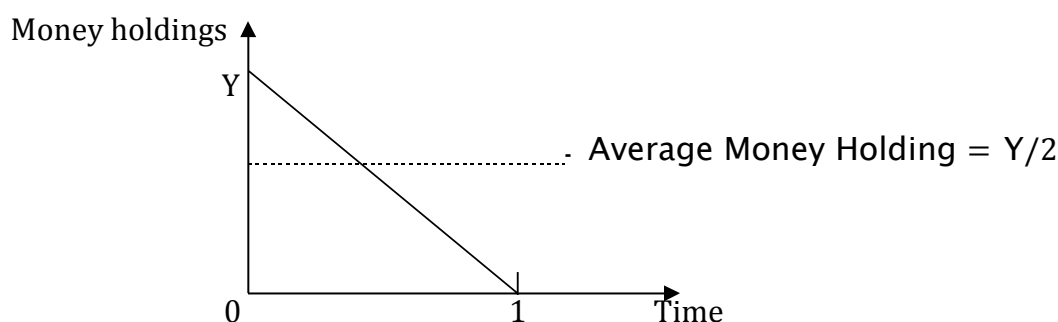
The first stage is where the individual agent, who receives an income payment for once per time period, say per month/year, but for the sake of simplicity, who spends at a constant rate over the period, converts his income into interest- bearing assets, for example, bonds

at time zero. The second stage is where the individual has to decide only the magnitude and timing of subsequent encashment (he/she tries to arrange things so as to minimize costs over the period).

Let's consider the different possibilities.

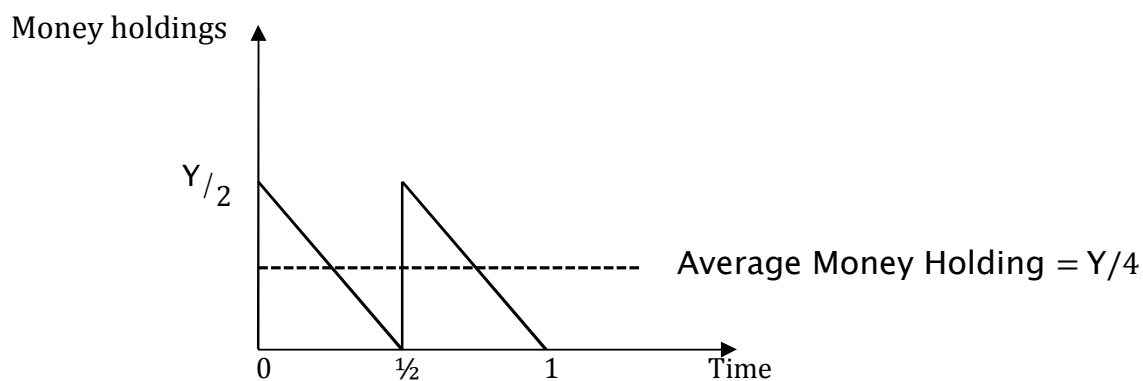
- The person could withdraw the Y dollars at the beginning of the year and gradually spend the money. Figure 3.2 shows the money holding over the course of the year under this plan. The money holding begin the year at Y and end the year at zero, averaging $Y/2$ over the year.

Figure-3.2: Money holdings with one trip to Bank



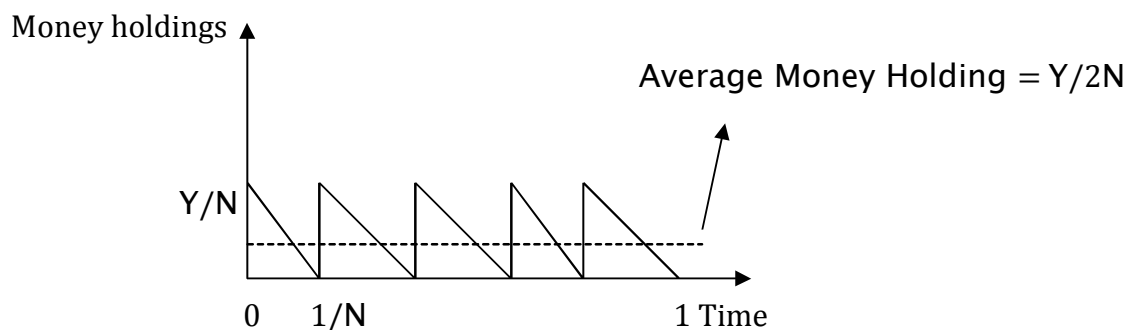
- A second possible plan is to make two trips to the bank. In this case, the person withdraws $Y/2$ dollars at the beginning of the year, gradually spends this amount over first half of the year, and then makes another trip to withdraw $Y/2$ for the second half of the year. Figure-3.3 shows that money holdings over the year vary between $Y/2$ and zero, averaging $Y/4$ over the year. This plan has the advantage that less money is held on average, so less interest is forgone, but it has the disadvantage of requiring two trips to the bank rather than one.

Figure: 3.3: Money holdings with two trips to bank ($N=2$)



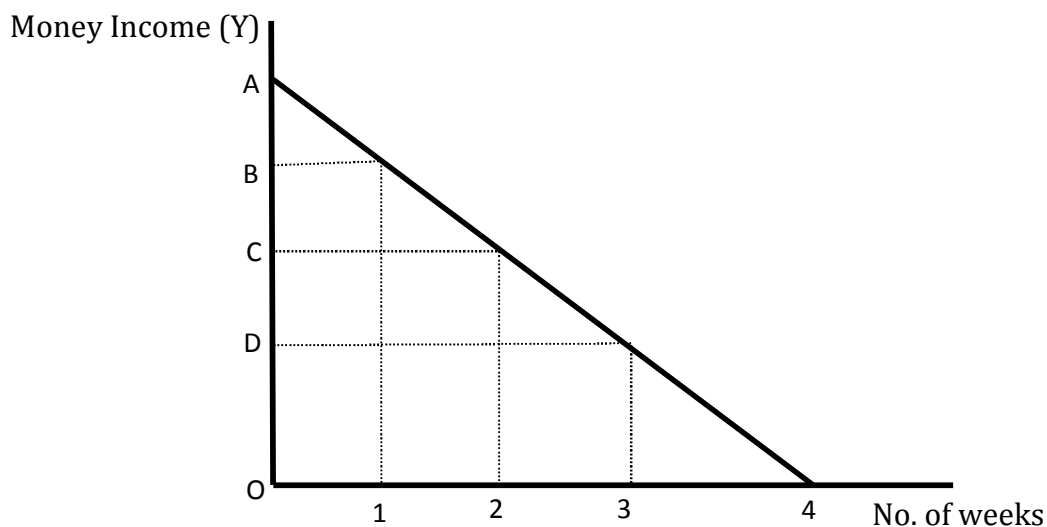
- Generally, suppose the individual makes N trips to the bank over the course of the year. On each trip, he/she withdraws Y/N dollars; then spends the money gradually over the following $\frac{1}{N}$ th of the year. Figure-3.4 shows that money holdings vary between Y/N and zero, averaging $Y/2N$ over the year.

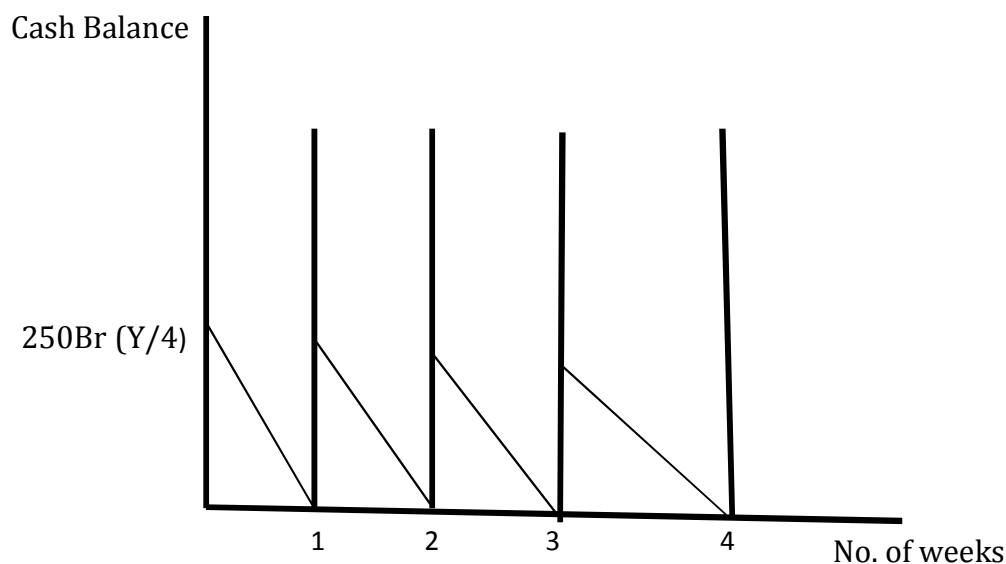
Figure: 3.4: Money Holdings with N trips to the Bank



Suppose a hypothetical individual (Mr. X.) has a monthly income of \$1000; further assume that Mr. X uniformly spends his whole income throughout the month. Then the amount of cash balance he decides to hold at the beginning of the month is a function of the relative net return on money. For instance, if he decides to hold $\frac{1}{4}$ of his income in cash balance, the graphical presentation of his expenditure pattern and the derivation of the Baumol- teeth graph looks the following:

Fig. 3.5 the derivation of Baumol-teeth graph





At the beginning of each time period, the individual receives OA amount of money income. The individual is assumed to spend this money income at a uniform rate. For example, he spends AB for the first week, BC for the second week, etc....

Note that: since his yearly nominal income is \$12,000 and his holdings of cash balance in each trip is \$250 ($1000/4$), the velocity of money ($V = PY/M$) is $\$12,000/\$250=48$.

However, the net result of this process is that the average cash balance held during the month is $\$1000/2(4) = \$125$ —just half of what it was before. Velocity has doubled to $\$12,000/\$125 = 96$.

The individual must decide what is the best timing and size of encashment from his bonds given the pattern of expenditure and the cost of encashment. The costs are of two types:

1. The interest, opportunity cost of holding money (the interest forgone by cashing the bonds); and
2. The pecuniary and subjective costs of making the encashment.

The pecuniary costs include costs of brokerage fees to sell the bond and stamp duties, while the subjective costs include costs of time and trouble of filling forms.

The analysis of costs and benefits of holding bonds as opposed to money led Baumol – Tobin to conclude that as interest rates increase, the amount of cash balance held for

transactions purposes will decrease, which in turn means that velocity will increase as interest rate increases. Similarly, an increase in brokerage fees leads the demand for transactions money balance to increase.

In short, the greater benefits to holding money balances relative to the opportunity cost of interest forgone, then the higher the demand for transactions balances. Besides, the transaction component of the demand for money is negatively related to the level of interest rates. Clearly, the lower his average cash balance, the more interest he will earn.

❖ **Mathematical analysis of the optimal choice of N and Average holding money**

- *The optimal choice of N is determined by different factors. The greater N is, the less money is held on average and the less interest is forgone. But as N increases, so does the inconvenience of making frequent trips to the bank.*

Suppose that the cost of going to the bank is some fixed amount F. F represents the value of the time spent traveling to and from the bank, waiting in line to make the withdrawal and trouble of filling forms. (For example, if a trip to the bank takes 15 minutes and a person's wage is \$12 per hour, then F is \$3). Also let i denote the interest rate; because money does not bear interest, i measures the opportunity cost of holding money.

Now we can analyze the optimal choice of N, which determines money demand. For any N, the average amount of money held is $Y/(2N)$, so the forgone interest is $iY/(2N)$. Because F is the cost per trip to the bank, the total cost of making trips to the bank is FN.

The total cost the individual bears is the sum of forgone interest and the cost of trips to the banks.

$$\text{Total cost} = \text{Forgone interest} + \text{Cost of trips}$$

$$C = iY/2N + FN$$

- *The larger the number of trips, N, the smaller the forgone interest and the larger the cost of going to the bank.*

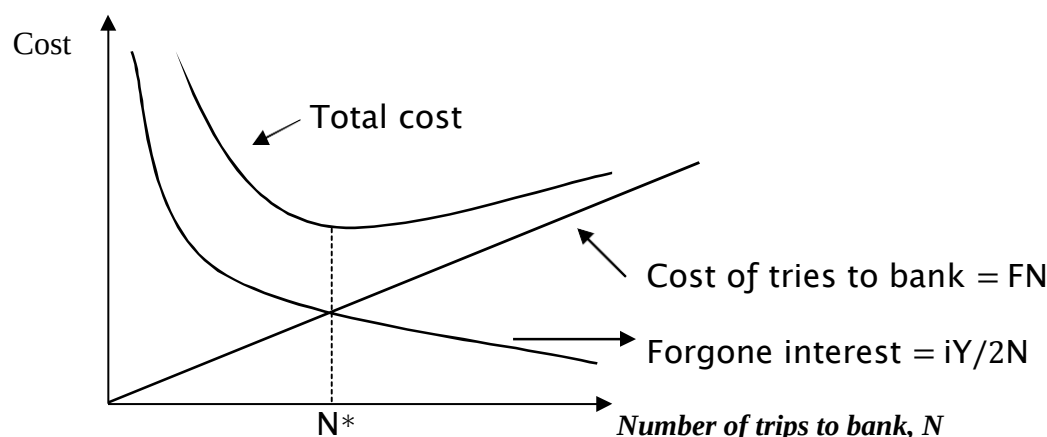
Figure-3.6 shows how *total cost depends on N*. There is one value of *N* that minimizes total cost. **The optimal value of *N* denoted by N^* is:**

$$N^* = \sqrt{\frac{iY}{2F}}$$

$$\text{Average Money Holding} = \frac{Y}{2N^*} = \sqrt{\frac{YF}{2i}}$$

$$\text{I.e., } \left(\frac{M}{P}\right)^d = \sqrt{\frac{YF}{2i}} = L(i, Y, F)$$

Figure: 3.6: The Cost of Money Holding



N^* is Number of trips that minimize total cost.

Summary: - The basic idea behind the Baumol- Tobin model is that there is an opportunity cost of holding money- the interest that can be earned on other assets. On the other hand, there is a benefit of holding money- the avoidance of transaction costs. When interest rates increase, people would try to economize on their holdings of money for transaction purposes because the opportunity cost of holding money rather than bonds would increase.

Therefore, the Baumol-Tobin money demand function shows that:

- ✓ The higher is i , the more income gain from holding interest bearing assets, the less likely to hold cash: Therefore $\uparrow i, \downarrow M^d$.
- ✓ The Higher income, Y , the higher is the demand for money, M^d
- ✓ The higher the cost of a trip to the bank, F , the higher is the demand for money, M^d



Dear Distance Learners! Think of the impact of ATMs on money demand! In recent years, Automatic Teller Machines are widely available in our country, Ethiopia.

- ✓ ***How do you think this affected N^* and money demand? Explain.***
- ✓ ***Which categories of money demand is affected by introduction of ATMs: transactions or Portfolio demand for money or both? How?***

Precautionary Demand: Models that explore the precautionary motive of the demand for money have been developed along lines similar to the Baumol-Tobin framework. Like the transactions demand, the precautionary demand is also affected by interest rate since the trade-off between return and transaction cost also applies here. If a person holds some amount of money as a precaution for future need of money, he will be losing some return. But if he puts the money (or part of it) in some interest bearing asset like the saving account, he will be getting a positive return [but he will have also to incur a transaction cost whenever he needs the money since he cannot use his saving account balance as it is.] Thus, the higher the interest rate, the larger money balance he will put in the form of saving account. The precautionary demand for money is also inversely related to interest rate.

Speculative Demand

Keynes's analysis of the speculative demand for money was open to several serious criticisms. It indicated that an individual hold only money as a store of wealth when the expected return on bonds is less than the expected return on money and holds only bonds when the expected return on bonds is greater than the expected return on money. Only when people have expected returns on bonds and money that are exactly equal (a rare instance) would they hold both. Keynes's analysis therefore implies that practically no one holds a diversified portfolio of bonds and money simultaneously as a store of wealth. Since diversification is apparently a sensible strategy for choosing which assets to hold, the fact that it rarely occurs in Keynes's analysis is a serious shortcoming of his theory of the speculative demand for money.

Tobin developed a model of the speculative demand for money that attempted to avoid this criticism of Keynes's analysis. His basic idea was that not only do people care about the

expected return on one asset versus another when they decide what to hold in their portfolio, but they also care about the riskiness of the returns from each asset. Specifically, Tobin assumed that most people are risk-averse—that they would be willing to hold an asset with a lower expected return if it is less risky. An important characteristic of money is that its return is certain; Tobin assumed it to be zero. Bonds, by contrast, can have substantial fluctuations in price, and their returns can be quite risky and sometimes negative. So even if the expected returns on bonds exceed the expected return on money, people might still want to hold money as a store of wealth because it has less risk associated with its return than bonds do.

The Tobin analysis also shows that people can reduce the total amount of risk in a portfolio by diversifying; that is, by holding both bonds and money. The model suggests that individuals will hold bonds and money simultaneously as stores of wealth. Since this is probably a more realistic description of people's behavior than Keynes's, Tobin's rationale for the speculative demand for money seems to rest on more solid ground.



How did Keynes and Baumol differ in treating interest rate as a variable of interest in explaining the behavior of money demand function. Use the following lines to discuss on the issue.

3.4. Freidman's Modern Quantity Theory of Money

Milton Friedman developed a theory of the demand for money in a famous article "*The quantity theory of money: a restatement*" in 1956. His analysis is closer to the approach used by Keynes and that of the Cambridge economists than to Fisher's quantity theory of money demand. However, instead of analyzing the specific motives for holding money, as Keynes did, Freidman stated that the demand for money must be influenced by the same factors that affect the demand for any kind of asset.

Accordingly, the demand for any asset, as Freidman argued, is affected by the relative return of its substitute assets in addition to the total wealth of the individual. More specifically, he claimed that the demand for money is affected by the resources available to the individual (wealth) and the expected returns of on other assets (which can serve as substitute for money) relative to the expected return on money, i.e. the opportunity cost of

holding money as represented by the expected returns on other assets relative to the expected return on money.

Like Keynes, Friedman recognized that people want to hold some *real* money balances. Individuals hold money balances as a medium of exchange and/ or a store of value because money is a durable asset. However, he claimed that it acts in both functions as one form of asset. Money balances could not be separated by the function they perform.

- *Money is demanded for its purchasing power (real value) and not for its nominal value!*

Friedman expressed his formulation of demand for money as:

$$M_d/P = f(Y_p, r_b - r_m, r_e - r_m, \pi_e - r_m, U) \text{ -----} 3.13$$

+ - - -

Where: M_d/P – demand for real money balances; Y_p – permanent income (the present discounted value of all expected future income); r_m – the expected return on money; r_b – the expected return on bonds; r_e – the expected return on equities; π_e – the expected inflation rate; and U – measures of tastes of individuals.

Dear learner! Let us look in more detail at the variables in the above Friedman's money demand function and what they imply for the demand for money.

Because the demand for an asset is positively related to wealth, money demand is positively related to Friedman's wealth concept, permanent income (indicated by the plus sign beneath it). Unlike our usual concept of income, permanent income (which can be thought of as expected average long-run income) has much smaller short run fluctuations because many movements of income are transitory (short-lived). For example, in a business cycle expansion, income increases rapidly, but because some of this increase is temporary, average long-run income does not change very much. Hence in a boom, permanent income rises much less than income. During a recession, much of the income decline is transitory, and average long-run income (hence permanent income) falls less than income. One implication of Friedman's use of the concept of permanent income as a determinant of the demand for money is that the demand for money will not fluctuate much with business cycle movements.

An individual can hold wealth in several forms besides money: Friedman categorized wealth in to three basic types of assets: bonds, equity (common stocks), and goods. The incentives for holding these assets rather than money are represented by the expected return on each of these assets relative to the expected return on money. The minus sign beneath each variable indicates that as each term rises, the demand for money falls.

The expected return on money, r_m , which appears in all the three terms, is influenced by two factors:

1. The services provided by banks on deposits included in the money supply, such as provision of receipts in the form of cancelled checks or the automatic paying of bills. When these services increase, the expected return for holding money rises.
2. The interest payments on money balances: New accounts and other deposits that are included in the money supply currently pay interest. As these interest payments rise, the expected return on money rises.

The terms $r_b - r_m$ and $r_e - r_m$ represent the expected return on bonds and equity relative to money. As they rise, the relative expected return on money falls, and the demand for money falls.

The term, $\Pi_e - r_m$, represents the expected return on goods relative to money. The expected return from holding goods is the expected rate of capital gains that occurs when their prices rise and hence is equal to the expected inflation rate, Π_e . If the expected inflation rate is 10 percent, for example, then goods' prices are expected to rise at a 10 percent rate, and their expected return is 10 percent. When $\Pi_e - r_m$ rises, the expected return on goods relative to money rises, which in turn results in the demand for money to fall.

Dear learner! You should remember the following basic points in relation to the Friedman's model for demand for money.

1. The signs underneath the above equation indicate whether the demand for money is positively/ negatively related to the terms above them.
2. Since data on human and total wealth was not available during his time, Friedman proxied total wealth by permanent income, Y_p .

3. Freidman's demand for money is derived from consumer's utility function, which represents individuals' tastes. Hence, he incorporated U for tastes in his money demand equation.
4. One implication of Freidman's use of the permanent income as a determinant of demand for money is that the demand for money will not fluctuate much with the business cycle movements.
5. Inflation is the cost of holding real money balances as against holding commodities.

In Freidman's view the demand for money is insensitive to interest rate- not because he viewed the demand for money as insensitive to changes in the opportunity cost of holding money, but rather because changes in interest rate should have little effect on the opportunity cost terms in the money demand function. The opportunity costs remain relatively constant, because any rise in the expected returns on other assets as a result of the rise in interest rates would be matched by a rise in the expected return on money.

Freidman's main concern in deriving his demand function was with money as an asset held as an alternative to other forms of holding wealth- a narrower analysis. He pointed out that money balances could not be separated by the function they performed.

3.5. Comparison on Keynesian Money Demand Model and Freidman's Money Demand Model

Dear distance learners! In the following paragraphs we will make a clear distinction and comparison between the Keynesian and the Freidman money demand model.

There are several differences between Friedman's theory of demand for money and the Keynesian's theory of demand for money. One is that by including many assets as alternatives to money, Friedman recognized that more than one type of asset is important to the aggregate economy. Keynes, for his part, jarred financial assets other than money into one big category – bonds – because he felt that their returns generally move together. If this is so, the expected return on bonds will be a good indicator of the expected return on other financial assets and there will be no need to include them separately in the money demand function.

Also, in contrast to Keynes, Friedman viewed money and goods as substitutes; that is, people choose between these assets when deciding how much money to hold. That is why Friedman included the expected return on goods relative to money as a term in his money demand function. The assumption that money and goods are substitutes indicates that changes in the quantity of money may have a direct effect on aggregate spending.

In addition, Friedman stressed on two issues in discussing his demand for money function that distinguish it from Keynes's liquidity preference theory. First, Friedman did not take the expected return on money to be constant, as Keynes did. When interest rates rise in the economy, banks make more profits on their loans, and they want to attract more deposits to increase the volume of their profitable loans. If there are no restrictions on interest payments on deposits, banks would attract deposits by paying higher interest rates on them. Because the industry is so competitive, the expected return on money held as bank deposits then rises with the higher interest rates on bonds and loans. The banks compete to get deposits until there are no excess profits, and in doing so they close the gap between interest earned on loans and interest paid on deposits. The net result of this competition in the banking industry is that $r_b - r_m$ [taken from the Friedman's money demand function] stays relatively constant when the interest rate i rises.



Dear learner! What if there are restrictions on the amount of interest that banks can pay on their deposits? Will the expected return on money be a constant? As interest rates rise, will $r_b - r_m$ rise as well?

Friedman thought not. He argued that although banks might be restricted from making pecuniary payments on their deposits, they can still compete on the quality dimension. For example, they can provide more services to depositors by providing more tellers, paying bills automatically, or providing more cash machines at more accessible locations. The result of these improvements in money services is that the expected return from holding deposits will rise. So, despite the restrictions on pecuniary interest payments, we might still find that a rise in market interest rates will raise the expected return on money sufficiently so that $r_b - r_m$ will remain relatively constant.

- *Unlike Keynes's theory, which indicates that interest rates are an important determinant of the demand for money, Friedman's theory suggests that changes in interest rates should have little effect on the demand for money.*

Therefore, Friedman's money demand function is essentially one in which Permanent income is the primary determinant of money demand, and his money demand equation can be approximated by

$$\frac{M_d}{P} = f(y_p) \dots \dots \dots 3.14$$

In Friedman's view, the demand for money is insensitive to interest rates – not because he viewed the demand for money as insensitive to changes in the incentives for holding other assets relative to money but rather because changes in interest rates should have little effect on these incentive terms in the money demand function.

The second issue Friedman stressed is the stability of the demand function. In contrast to Keynes, Friedman suggested that random fluctuations in the demand for money are small and that the demand for money can be predicted accurately by the money demand function. When combined with his view that the demand for money is insensitive to changes in interest rates, this means that velocity is highly predictable. We can see this by writing down the velocity that is implied by the money demand equation as:

$$V = \frac{Y}{f(y_p)} \dots \dots \dots 3.15$$

Because the relationship between Y and Y_p is usually quite predictable, a stable money demand function (one that does not undergo pronounced shifts so that it predicts the demand for money accurately) implies that velocity is predictable as well. If we can predict what velocity will be in the next period, a change in the quantity of money will produce a predictable change in aggregate spending. Even though velocity is no longer assumed to be constant, the money supply continues to be the primary determinant of nominal income as in the quantity theory of money demand. Therefore, Friedman's theory of money demand is indeed a restatement of the quantity theory of money demand because it leads to the same conclusion about the importance of money to aggregate spending.



Can Friedman's money demand formulation explain this pro-cyclical velocity phenomenon as well?

The key clue to answering this question is the presence of permanent income rather than measured income in the money demand function.



What do you think would happen to the permanent income in a business cycle expansion?

Because much of the increase in income will be transitory, permanent income rises much less than income. Friedman's money demand function then indicates that the demand for money rises only a small amount relative to the rise in measured income and as the above equation indicates, velocity rises. Similarly, in a recession, the demand for money falls less than income because the decline in permanent income is small relative to income, and velocity falls. In this way, we have the pro-cyclical movement in velocity.

To summarize, Friedman's theory of the demand for money used a similar approach to that of Keynes than that of the earlier Cambridge economists but did not go in to detail about the motives for holding money. Instead, Friedman made use of the theory of portfolio choice to indicate that the demand for money will be a function of permanent income and the expected returns on alternative assets relative to the expected return on money.

The following are the major differences between Friedman's theory and Keynes's theory of money demand.

- i. Friedman believed that changes in interest rates have little effect on the expected returns on other assets relative to money. Thus, in contrast to Keynes, he viewed the demand for money as insensitive to interest rates.
- ii. Friedman differed from Keynes in stressing that the money demand function does not undergo substantial shifts and so is stable. These two differences also indicate that velocity is predictable yielding a quantity theory conclusion that money is the primary determinant of aggregate spending.
- iii. Though Friedman claimed that his demand for money theory is a restatement of the quantity theory of money, his work is more of an elaboration of Keynes's theory of demand function or the Tobin's portfolio approach.

- iv. Freidman claimed that both money demand and velocity of circulation are highly stable, a point of departure from the Keynesian analysis of demand for money. For the latter these functions are volatile and unpredictable, which led him to conclude that monetary policies could not be reliable stabilization policies, so that fiscal policies are the preferred policy tools.
- v. While Keynes grouped all assets alternative to money to one- bonds, Freidman recognized many alternative assets such as equity, bonds, and goods and services.
 - *Of course, Freidman's assertion that monetary policies are also significant in affecting the aggregate demand was accepted by the 1960s Keynesians. And this had led to the emergence of a synthesis- called Neoclassical- Keynesian synthesis in the 1960s.*

In general, the effect of interest rate on the quantity of money demanded is important in the development of the theory of the demand for money. This is so because it is important to see the effect of money on the overall economy.

Today and Tomorrow...

Dear learner! The basic agendum in current research works on the money demand function is about the stability of this function. It seems to be that the most likely cause of money demand's instability is the rapid pace of financial innovation occurring after 1973 (after the **Breton Woods** agreement is closed and a floating exchange rate regime is introduced), which has changed what items can be counted as money. The evidence is still somewhat tentative, however, and a truly stable and satisfactory money demand function has not yet been found and so the search for a stable money demand function goes on.

The recent instability of the money demand function calls into question whether our theories and empirical analyses are adequate. It also has important implications for the way monetary policy should be conducted because it casts doubt on the usefulness of the money demand function as a tool to provide guidance to policymakers. In particular, because the money demand function has become unstable, velocity is now harder to predict, and hence, setting rigid money supply targets in order to control aggregate spending in the economy may not be an effective way to conduct monetary policy.

Chapter Three: Review Questions

Part I: Choose a single best answer for the following questions

- 1) One of the following is **WRONG** about the theories of demand
 - A) Quantity theory of money rejects the role of interest rate as a determinant of money
 - B) Cambridge economists allows interest rate to affect the demand for money
 - C) Keynes indicates transaction and speculative motives are directly affected by interest rate.
 - D) Baumol- Tobin model shows the negative impact of velocity of money on money demand.
 - E) In Freidman's view the demand for money is insensitive to interest rate.
- 2) Which one of the following is false about the quantity theory of money?
 - A) Money demand is the function of nominal income
 - B) It traces the relationship of interest rate and money demand
 - C) Velocity is found relatively stable at least in short run
 - D) It is set with the assumption of full employment
 - E) None of the above
- 3) Which one of the following is true about Keynesian money demand theory?
 - A) For Keynes, money is demanded mainly for transaction purpose
 - B) When the expected rate of interest is higher than the current rate of interest, the demand for money for speculative purpose will rise
 - C) He emphasized on permanent income as determinant of money demand
 - D) He found velocity of money negatively affected by interest rate
 - E) None of the above
- 4) Which one of the following is true about Baumol-Tobin theory of money demand?
 - A) An increase in brokerage fee for bonds (b) reduces the demand for money
 - B) Income was found to affect money demand with a similar trend that of Fisher
 - C) Transaction demand for money is not a function of interest rate

- D) Economies of scale in usage of money explains why money demand increases less proportionately due increase in income
- E) None of the above
- 5) Which one is CORRECT about speculative demand for money motive of Keynes?
- A) This motive is not subject to liquidity trap problem
- B) Such motive can be affected by life time holding of houses & Jewelries
- C) This motive is directly affected by interest rate
- D) Keynes consider holding of common stocks is an alternative to money
- E) All of the above
- 6) Which one of the following is **false** about the quantity theory of money?
- A) Money demand is the function of nominal income
- B) It traces the relationship of interest rate and money demand
- C) Velocity is found relatively stable at least in short run
- D) It is set with the assumption of full employment
- E) None of the above

Part II: Give a short and precise answer for the following questions

- 7) Following the 2008 economic crisis, it takes different time period in order to recover with ample time of recovery for Europe than United States. Paul Krugman, a columnist in “NEW YORK TIMES” hinted that the slow recovery of Europe even though a consecutive bailout is due to the ‘liquidity trap’ it faced with. If we agree with his saying, theoretically explain why monetary policy (in this case bailout) is ineffective if the economy is in liquidity trap. What policy option do you recommend if our country faces the same situation to escape the liquidity trap?
- 8) Why is Keynes’s analysis of the speculative demand for money important to his view that velocity will undergo substantial fluctuations and thus cannot be treated as constant?
- 9) If interest rates on bonds go to zero, what does the Baumol-Tobin analysis suggest about average holdings of money balances should be?

Chapter Four

The Theory of Money Supply

Introduction

In Economics, if we discuss the demand for something, it is common that we automatically start to think of the supply of the same thing. Thus, this chapter is devoted to the discussion of the money supply process and the determinants of same.

The supply of money is critical to the overall health of a given economy in general and to its macroeconomic performance in particular. As an economic variable, money supply has a visible impact on interest rates, inflation, and the economy's output of goods and services. Fluctuations in money supply affect returns on investment, the prices of goods & services, and the general well-being of societies.

Dear distance learners! When you complete your study of this chapter you will understand and be able to explain mainly the following important issues:

- ✓ What is the role of borrowers & the banking system in the money creation process?
- ✓ Exactly how the money creation process occurs?
- ✓ How the money supply is determined?
- ✓ Who controls the money supply?
- ✓ What causes the money supply to change?
- ✓ How might control of the money supply be improved?

Dear learner! In this particular chapter, we answer these questions by providing a detailed analysis of the money supply process and the elements that determine the money supply process.

4.1. The Players in the Money Supply Process



Dear distance learner! Whom do you think is/are the active participant/s in the money market? Let you reflect your ideas on the following lines.

Commonly speaking, the following four units are believed to be the main characters in the money supply process.

1. **The Central Bank:** This is the government agency that oversees the banking system. It is the responsible body for the conduct of monetary policy in economies of the world. This bank takes different names in different countries. In Ethiopia, it is called as the National Bank of Ethiopia (NBE).
2. **Banks (depository institutions):** These are the financial intermediaries that accept deposits from individuals & institutions and make loans. They include units such as commercial banks, savings & loan associations, mutual savings banks, and credit unions.
3. **Depositors:** these are individuals and institutions that hold deposits in banks.
4. **Borrowers from banks:** these are individuals and institutions that borrow from the depository institutions & institutions that issue bonds that are purchased by the depository institutions.

Most of the economies of the world have delegated the control of money supply to their Central Bank. This is supported by the claim that the theory of the money supply process for any given economy has to start with the knowledge of whether or not its Central Bank exogenously determines the money supply, thereby cancelling out any undesired changes in it induced by other factors in the economy. If it does so, the final determinant of the money supply would be the Central Bank's actions. However, if it allows other units/factors some role in determining the money supply, a wider analysis of money supply becomes inevitable.

In most traditional macroeconomic literature, we find a common belief that the Central Bank is able to control money supply. In the Keynesian macroeconomic analysis (specifically in the IS-LM model), we assume that money supply is an exogenously determined variable.

However, we have to be realistic in that, the Central Bank is unable (in most cases) to determine the exact value of money supply in the economy. The process of money supply determination is related to the existence of financial intermediaries, whose operation in turn is dependent on the existence of some money surplus group and some other money deficit group in the economy. [Otherwise, in a world of balanced budgets, there is no role for financial intermediaries!]

In short, money is not a fully policy determined variable. Because the behavior of the general public affects the money supply in the market either directly (by controlling their currency holdings) or indirectly (by affecting the behavior of commercial banks in the markets in deciding the amount of deposit they decide to put with the Central Bank). No matter how the money supply in the economy is defined and/or measured, the common participants- the Central Bank, the general public, and the commercial banks- play a major role in the determination of money supply. Accordingly, it is believed that [and in line with the above description of the characters in the money supply market]:

- i. The Central Bank determines the monetary base and the reserve requirements (obligation of banks to deposit a fraction of their deposits in central bank), and sets the discount rate on the reserves;
- ii. The general public determines its currency holdings relative to its demand deposits; and
- iii. The commercial banks, for a given required reserve ratio, determine their actual demand for reserves as against their demand deposit liabilities.

There is a considerable interaction among the behavior of the Central Bank, the general public, and the commercial banks in the money supply process. The Central Bank, as a policy making unit, decides on the total amount of money desirable for the economy. But, in doing so, the bank has to take into account the responses of the general public and the commercial banks. Money supply comes to the financial market in the form of currencies from the Central Bank, while it comes in the form of demand deposits from the commercial banks and the general public.

However, the behavior of the Central Bank cannot be explained by a standard hypothesis such as the profit maximization for firms or the utility maximization for individual consumers. Instead, we try to look at the way the bank operates by dealing with its balance sheet elements. Dear distance learners! You should remember that the deposits of non-bank financial institutions are not part of the money supply and so there is no direct influence by these institutions on the money supply.

In the following lines of our discussion, we would like to look at the elements of the balance sheet of the Central Bank. The Bank tries to control this statement through its monetary

policy actions. That is why we say the operation of the Central Bank and its conduct of monetary policy involves actions that affect its balance sheet.

4.2. The Central Bank's Balance Sheet and Control of the Monetary Base

4.2.1 The Balance Sheet of the Central Bank

Let's examine each of the categories of assets and liabilities of the bank, because changes in each of them have an important impact on the money supply.

I. *Assets:* The assets include the following elements.

A. Securities – these consist primarily of treasury bills. The total amount of these bills is controlled by open market operations (the Central Bank's purchase and sale of securities [we will discuss these in the next section in detail]). Securities are the largest category of assets in the Central Bank's balance sheet.

B. Discount loans- these are loans the Central Bank makes to banks. It is affected by the discount rate- the rate the bank charges banks for such loans.

These first two elements of the bank's assets are vital because they earn interest income, and because the liabilities of the bank do not pay interest; i.e. its assets earn income and its liabilities cost nothing. Although it returns most of its earnings to the government, the bank does spend some of it on "worthy causes" such as supporting economic research.

C. Gold and SDR certificate accounts. Special drawing rights (SDR) are issued to governments by the International Monetary Fund (IMF) to settle international debts and have replaced gold in international financial transactions. When the treasury acquires gold or SDRs, it issues certificates to the Central Bank that are claims on the gold or SDRS and is in turn credited with deposit balances at the bank.

D. Coins- these are the smallest items in the balance sheet of the Central Bank.

E. Cash items in process of collection- these arise from the Central Bank's check-clearing process. When a check is given to the bank for clearing, the Central Bank will present it to the bank on which it is written and will collect funds by deducting the amount of the check from the bank's deposits

(reserves) with the Central Bank. Before these funds are collected, the check is a cash item in process of collection and is a Central Bank asset.

- F. Other Central Bank reserve assets.** These include deposits and bonds denominated in foreign currencies as well as physical assets such as computers, office equipment, and buildings owned by the Central Bank.

II. Liabilities: *The liabilities of the bank's account include the following elements:*

- A. Central Bank notes (currency) outstanding.** The Central Bank issues currency (those pieces of paper in your wallet). These bank notes outstanding are the amount of a given currency in the hands of the public. (Currency held by depository institutions is also a liability of the Central Bank but is counted as part of the reserves liability.)
- B. Reserves.** All banks have an account at the Central Bank in which they hold deposits. Reserves consist of deposits at the Central Bank plus currency that is physically held by banks (called vault cash because it is stored in the banks vaults). Reserves are assets for the banks but liabilities for the Central Bank because the banks can demand payment on them at any time. [As you will see, an increase in reserves leads to an increase in the level of deposits and the money supply.]

Total reserves can be divided in to two categories: reserves that the Central Bank requires banks to hold (**required reserves**) and any additional reserves the banks choose to hold (**excess reserves**) in their vaults. For example, the Central Bank might require that for every birr of deposits at a depository institution, a certain fraction (say, 10 cents) must be held as reserves with it. This fraction (10 percent) is called the **required reserve ratio**.

In the following table, a summary of the elements of the balance sheet of the Bank is depicted.

Table 4.1: Central Bank Balance Sheet

Assets	Liabilities
• Securities • Discount loans ✓ Government ✓ Banks ✓ Non-bank public • Fixed assets • International Reserve ✓ Foreign exchange ✓ Gold • Other assets	• Currency in circulation (notes and coins) • Deposits (Reserves) ✓ Banks reserve ✓ Government reserve ✓ Foreign liabilities
	Capital
Total assets	Total Liabilities & Capital

4.2.2. Monetary Base of the Central Bank

Dear learner! The first two liabilities on the balance sheet of the Central bank, Central bank notes (currency) outstanding and reserves are often referred to as the **monetary liabilities** of the Central bank. When we add to these liabilities the Treasury's monetary liabilities (Treasury currency in circulation, primarily coins), we get a construct called the **monetary base**. The monetary base is an important part of the money supply because increases in it will lead to a multiple increase in the money supply (everything else being constant). This is why the monetary base is also called **high-powered money**. Recognizing that Treasury currency & Central bank currency can be lumped together in to the category currency in circulation, denoted by C, the monetary base equals the sum of currency in circulation C plus reserves R. The monetary base MB is expressed as

MB = Currency in circulation + reserves

$$= C + R$$

The items on the right-hand side of this equation indicate how the base is used and are called the **uses of the base**.

4.2.3 Control of the Monetary Base

The central bank exercises control over the monetary base through its purchases or sale of government securities in the open market, called **open market operations**, and through its extension of **discount loans to banks**.

4.2.3.1 Open market operation (OMO)

Dear distance learners! The primary way in which the central bank causes changes in the monetary base is through its open market operations. A purchase of bonds by the central bank is called an **open market purchase**, and a sale of bonds by the central bank is called an **open market sale**.

A. Open market purchases

Open market purchase from the bank: Suppose that the National Bank of Ethiopia purchases Birr 100 of bonds from a bank and pays for them with a Birr 100 check. The bank will either deposit the check in its account with the National bank or cash it in for currency, which will be counted as vault cash. To understand what occurs as a result of this transaction, we look at T-accounts, which list **only the changes that occur in balance sheet items starting from the initial balance sheet position**. Either action means that the bank will find itself with Birr 100 more reserves and a reduction in its holdings of securities of Birr 100 since it sells it to the National Bank. The T-account for the banking system, then is

BANKING SYSTEM	
Assets	Liabilities
Securities	-\$100
Reserves	+\$100

The National bank meanwhile finds that its liabilities have increased by the additional Birr 100 of reserves, while its assets have increased by the Birr 100 of additional securities that it now holds. Its T-account is

National Bank of Ethiopia

Assets		Liabilities	
Securities	+\$100	Reserves	+\$100

The net result of this open market purchase is that reserves have increased by \$100, the amount of the open market purchase. Because there has been no change of currency in circulation, the monetary base has also risen by \$100 since monetary base is the summation of Reserves and currency in circulation.

OPEN MARKET PURCHASE FROM THE NONBANK PUBLIC (Persons or/and

corporations): To understand what happens when there is an open market purchase from the nonbank public; we must look at two cases. First, let's assume that the person or corporation that sells the \$100 of bonds to the Central bank deposits the Central bank's check in the local bank. The nonbank public's T-account after this transaction is

NONBANK PUBLIC

Assets		Liabilities	
Securities	-\$100		
Checkable deposits	+\$100		

When the bank receives the check, it credits the depositor's account with the \$100 and then deposits the check in its account with the Central bank, thereby adding to its reserves. The banking system's T-account becomes

Banking System

Assets		Liabilities	
Reserves	+\$100	Checkable deposits	+\$100

The effect on the Central bank's balance sheet is that it has gained \$100 of securities in its asset's column, while it has an increase of \$100 of reserves in its liability's column:

Central bank			
Assets		Liabilities	
Securities	+\$100	Reserves	+\$100

Dear distance learners! As you can see in the above T-account, when the Central bank's check is deposited in a bank, the net result of the Central bank's open market purchase from the nonbank public is identical to the effect of its open market purchase from a bank: Reserves increase by the amount of the open market purchase, and the monetary base increases by the same amount.

If, however, the person or corporation selling the bonds to the Central bank cashes the Central bank's check either at a local bank or at a Central bank for currency, the effect on reserves is different. This seller will receive currency of \$100 while reducing holdings of securities by \$100. The bond seller's T-account will be:

Nonbank Public			
Assets		Liabilities	
Securities	-\$100		
Currency	+\$100		

The Central bank now finds that it has exchanged \$100 of currency for \$100 of securities, so its T-account is

Central Bank			
Assets		Liabilities	
Securities	+\$100	Currency in Circulation	+\$100

The net effect of the open market purchase in this case is that reserves are unchanged, while currency in circulation increases by the \$100 of the open market purchase. Thus the monetary base increases by the \$100, amount of the open market purchase, while reserves do not. This contrasts with the case in which the seller of the bonds deposits the Central bank's check in a bank; in that case, reserves increase by \$100, and so does the monetary base.

The analysis reveals that ***the effect of an open market purchase on reserves depends on whether the seller of the bonds keeps the proceeds from the sale in currency or in deposits***. If the proceeds are kept in Currency, the open market purchase has no effect on reserves; if the proceeds are kept as deposits, reserves increase by the amount of the open market purchase. ***The effect of an open market purchase on the monetary base, however, is always the same (the monetary base increases by the amount of the purchase) whether the seller of the bonds keeps the proceeds in deposits or in currency.*** The impact of an open market purchase on reserves is much more uncertain than its impact on the monetary base.

B. Open market sales: If the Central bank sells \$100 of bonds to a bank or the nonbank public; the monetary base will decline by \$100. For example, if the Central bank sells the bonds to an individual who pays for them with currency, the buyer exchanges \$100 of currency for \$100 of bonds, and the resulting T-account is

Nonbank Public	
Assets	Liabilities
Securities	+\$100
Currency	-\$100

The Central bank, for its part, has reduced its holdings of securities by \$100 and has also lowered its monetary liability by accepting the currency as payment for its bonds, thereby reducing the amount of currency in circulation by \$100:

Central bank

Assets		Liabilities	
Securities	-\$100	Currency in Circulation	-\$100

The effect of the open market sale of \$100 of bonds is to reduce the monetary base by an equal amount, although reserves remain unchanged. Manipulations of T-accounts in cases in which the buyer of the bonds is a bank or the buyer pays for the bonds with a check written on a checkable deposit account at a local bank lead to the same \$100 reduction in the monetary base, although the reduction occurs because the level of reserves has fallen by \$100.

Dear distance learners! The following conclusion can be drawn from our analysis of open market purchases and sales: **The effect of OMO on the monetary base is much more certain than the effect on reserves. Therefore, the central bank can control the monetary base with OMO more effectively than it can control reserves.**

Open market operations can also be done in other assets besides government bonds and have the same effects on the monetary base we have described here. One example of this is a foreign exchange intervention by the Central bank.

4.2.3.2 Discount Loans

In this chapter so far we have seen changes in the monetary base solely as a result of open market operations. However, the monetary base is also affected when the Central bank makes a discount loan to a bank. When the Central bank made a \$100 discount loan to the Commercial Bank of Ethiopia, the bank was credited with \$100 of reserves from the proceeds of the loan. The effects on the balance sheet of the banking system and the Central bank are illustrated by the following T-accounts:

Banking system				Central Bank			
Asset		Liabilities		Asset		Liabilities	
Reserve	+\$100	Discount	+\$100	Discount	+\$100	Reserve	+\$100
		Loans		Loans			

The monetary liabilities of the Central bank have now increased by \$100 and the monetary base, too, has increased by this amount. However, if a bank pays off a loan from the Central bank, thereby reducing its borrowings from the Central bank by \$100, the T-accounts of the banking system and the Central bank are as follows:

Banking system				Central Bank			
Asset		Liabilities		Asset		Liabilities	
Reserve	-\$100	Discount	-\$100	Discount	-\$100	Reserve	-\$100
		Loans		Loans			

The net effect on the monetary liabilities of the Central Bank, and hence on the monetary base, is then a reduction of \$100. We see that the monetary base changes one-for-one with the change in the borrowings from the Central bank.

Dear distance learners! Please Note the following points

- ✓ *Currencies in circulation are assets for the public, but liabilities for the Central Bank.*
- ✓ *Reserves are assets for the commercial banks, but liabilities for the Central Bank.*
- ✓ *As to the reserves, all banks have an account at the Central Bank in which they hold deposits. Reserves include deposits at the Central Bank plus currency that is physically held by banks- called vault cash (excessive reserves).*

4.3 Multiple deposit creation: the simple model

Dear distance learners! With our understanding of how the Central bank controls the monetary base and the banking system, we now have the tools necessary to explain how deposits are created. When the Central bank supplies the banking system with \$1 of additional reserves, deposits increase by a multiple of this amount - a process called **multiple deposit creation**.

4.3.1 Deposit Creation: The Single Bank

Suppose that the \$100 open market purchase described earlier was conducted with the Commercial Bank of Ethiopia. After the Central bank has bought the \$100 bond from the Commercial Bank of Ethiopia, the bank finds that it has an increase in reserves of \$100. To analyze what the bank will do with these additional reserves, assume that the bank does not want to hold excess reserves because it earns no interest on them, we begin the analysis with the following T-account:

Commercial Bank of Ethiopia		
Assets		Liabilities
Securities	-\$100	
Reserves	+\$100	

Because the bank has no increase in its checkable deposits, required reserves remain the same, and the bank finds that its additional \$100 of reserves means that its excess reserves have increased by \$100. Let's say that the bank decides to make a loan equal in amount to the \$100 increase in excess reserves. When the bank makes the loan, it sets up a checking account for the borrower and puts the proceeds of the loan into this account. In this way the bank alters its balance sheet by increasing its liabilities with \$100 of checkable deposits and at the same time increasing its assets with the \$100 loan. The resulting T-account looks like this:

Commercial Bank of Ethiopia		
Assets		Liabilities
Securities	-\$100	Checkable deposits (+100)
Reserves	+\$100	
Loans	+\$100	

Dear learner! The bank has created checkable deposits by its act of lending. Because checkable deposits are part of the money supply, the bank's act of lending has in fact created money.

In its current balance sheet position, the Commercial Bank of Ethiopia still has excess reserves and so might want to make additional loans. However, these reserves will not stay at the bank for very long. The borrower took out a loan not to leave \$100 idle at the Commercial Bank of Ethiopia but to purchase goods and services from other individuals and corporations. When the borrower makes these purchases by writing checks, they will be deposited at other banks, and the \$100 of reserves will leave the Commercial Bank of Ethiopia. **A bank cannot safely make loans for an amount greater than the excess reserves it has before it makes the loan.**

The final T-account of the Commercial Bank of Ethiopia is

Commercial Bank of Ethiopia		
Assets		Liabilities
Securities	-\$100	
Loans	+\$100	

The increase in reserves of \$100 has been converted into additional loans of \$100 at the Commercial Bank of Ethiopia, plus an additional \$100 of deposits that have made their way to other banks. (All the checks written on accounts at the Commercial Bank of Ethiopia are deposited in banks rather than converted into cash because we are assuming that the public does not want to hold any additional currency.) Now let's see what happens to these deposits at the other banks.

4.3.2 Deposit Creation: The Banking System

Dear distance learners! To simplify the analysis, let us assume that the \$100 of deposits created by Commercial Bank of Ethiopia's loan is deposited at Wegagen Bank and that this bank and all other banks hold no excess reserves. Wegagen's T-account becomes

Wegagen Bank			
Assets		Liabilities	
Reserves	+\$100	Checkable deposits	+\$100

If the required reserve ratio is 10 percent, this bank will now find itself with a \$10 increase in required reserves, leaving it \$90 of excess reserves. Because Wegagen Bank (like the Commercial Bank of Ethiopia) does not want to hold on to excess reserves, it will make loans for the entire amount. Its loans and checkable deposits will then increase by \$90, but when the borrower spends the \$90 of checkable deposits, they and the reserves at Wegagen Bank will fall back down by this same amount. The net result is that Wegagen Bank's T-account will look like this:

Wegagen Bank			
Assets		Liabilities	
Reserves	+\$10	Checkable deposits	+\$100
Loans	+\$90		

If the money spent by the borrower to whom Wegagen Bank lent the \$90 is deposited in another bank, such as Awash International Bank, the T-account for Awash International Bank will be

Awash International Bank			
Assets		Liabilities	
Reserves	+\$90	Checkable deposits	+\$90

The checkable deposits in the banking system have increased by another \$90, for a total increase of \$190 (\$100 at Wegagen Bank plus \$90 at Awash International Bank). In fact, the distinction between Wegagen Bank and Awash International Bank is not necessary to obtain the same result on the overall expansion of deposits. If the borrower from Wegagen Bank writes checks to someone who deposits them at Wegagen Bank, the same change in deposits would occur. The T-accounts for Awash International Bank would just apply to Wegagen Bank, and its checkable deposits would increase by the total amount of \$190.

Awash International Bank will want to modify its balance sheet further. It must keep 10 percent of \$90 (\$9) as required reserves and has 90 percent of \$90 (\$81) in excess reserves and so can make loans of this amount. Awash International Bank will make an \$81 loan to a borrower, who spends the proceeds from the loan. Awash International Bank T-account will be

Awash International Bank

Assets		Liabilities	
Reserves	+\$9	Checkable deposits	+\$90
Loans	+\$81		

The \$81 spent by the borrower from Awash International Bank will be deposited in another bank (Dashen Bank). Consequently, from the initial \$100 increase of reserves in the banking system, the total increase of checkable deposits in the system so far is \$271 (= \$100 + \$90 + \$81).

Following the same reasoning, if all banks make loans for the full amount of their excess reserves, further increments in checkable deposits will continue (at Dashen Bank, Abyssinia Bank, United Bank, and so on), as depicted in Table 4.2. Therefore, the total increase in deposits from the initial \$100 increase in reserves will be \$1,000: The increase is tenfold, the reciprocal of the 0.10 reserve requirement.

If the banks choose to invest their excess reserves in securities, the result is the same. If Wegagen Bank had taken its excess reserves and purchased securities instead of making loans, its T-account would have looked like this:

Wegagen Bank

Assets		Liabilities	
Reserves	+\$10	Checkable deposits	+\$100
Securities	+\$90		

When the bank buys \$90 of securities, it writes a \$90 check to the seller of the securities, who in turn deposits the \$90 at a bank such as Awash International Bank. Awash International Bank's checkable deposits rise by \$90 and the deposit expansion process is the same as before. **Whether a bank chooses to use its excess reserves to make loans or to purchase securities, the effect on deposit expansion is the same.**

TABLE 4.2: Creation of Deposits (assuming 10 percent reserve requirement and a \$100 increase in reserves)

Bank	Increase in Deposits (\$)	Increase in Loans (\$)	Increase in Reserves (\$)
Commercial Bank of Ethiopia	0.00	100.00	0.00
Wegagen Bank	100.00	90.00	10.00
Awash International Bank	90.00	81.00	9.00
Dashen Bank	81.00	72.90	8.10
Abyssinia Bank	72.90	65.61	7.29
United Bank	65.61	59.05	6.56
Nib International Bank	59.05	53.14	5.91
.	.	.	.
.	.	.	.
Total for all bank	1,000.00	1,000.00	100.00

Dear distance learners! You can now see the difference in deposit creation for the single bank versus the banking system as a whole. Because a single bank can create deposits, equal only to the amount of its excess reserves, it cannot by itself generate multiple deposit expansion. A single bank cannot make loans greater in amount than its excess reserves because the bank will lose these reserves as the deposits created by the loan find their way to other banks.

However, the banking system as a whole can generate a multiple expansion of deposits because when a bank loses its excess reserves, these reserves do not leave the banking System even though they are lost to the individual bank. So as each bank makes a loan and

creates deposits, the reserves find their way to another bank, which uses them to make additional loans and create additional deposits. Dear learner! As you have seen, this process continues until the initial increase in reserves results in a multiple increase in deposits.

The multiple increases in deposits generated from an increase in the banking system's reserves is called the **simple deposit multiplier**. In our example with a 10 percent required reserve ratio, the simple deposit multiplier is 10. More generally, the simple deposit multiplier equals the reciprocal of the required reserve ratio, expressed as a fraction ($10 = 1/0.10$), so the formula for the multiple expansions of deposits can be written as

$$\Delta D = \frac{1}{r_D} \times \Delta R \dots\dots\dots (4.2)$$

Where: ΔD = change in total checkable deposits in the banking system

r_D = required reserve ratio (0.10 in the example)

ΔR = change in reserves for the banking system (\$100 in the example).

The multiple deposit creation process should also work in reverse; that is, when the Central Bank withdraws reserves from the banking system, there should be a multiple contraction of deposits. Next we discuss how the simple deposit multiplier is derived.

4.3.3. Deriving the Formula for simple deposit multiplier

Dear learner! The formula for the multiple creations of deposits can also be derived directly using algebra. We obtain the same answer for the relationship between a change in deposits and a change in reserves, but more quickly.

Our assumption that banks do not hold on to any excess reserves means that the total amount of required reserves for the banking system RR will equal the total reserves in the banking system R :

$$RR = R \dots\dots\dots (4.3)$$

The total amount of required reserves equals the required reserve ratio r_D times the total amount of checkable deposits D :

$$RR = r_D \times D \dots\dots\dots (4.4)$$

Substituting $r_D \times D$ for RR in equation 4.3,

$$r_D \times D = R \dots\dots\dots (4.5)$$

and dividing both sides of the preceding equation by r_D gives us

$$D = \frac{1}{r_D} \times R \dots\dots\dots (4.6)$$

Taking the change in both sides of this equation and using delta to indicate a change,

$$\Delta D = \frac{1}{r_D} \times \Delta R \dots\dots\dots (4.7)$$

which is the same formula for deposit creation found in Equation 4.2.

This derivation provides us with another way of looking at the multiple creations of deposits because it forces us to look directly at the banking system as a whole rather than one bank at a time. For the banking system as a whole, deposit creation (or contraction) will stop only when all excess reserves in the banking system are gone; that is, the banking system will be in equilibrium when the total amount of required reserves equals the total amount of reserves, as seen in the equation $RR = R$. When $r_D \times D$ is substituted for RR , the resulting equation $R = r_D \times D$ tells us how high checkable deposits will have to be in order for required reserves to equal total reserves. Accordingly, a given level of reserves in the banking system determines the level of checkable deposits when the banking system is in equilibrium (when $ER = 0$); put another way, the given level of reserves supports a given level of checkable deposits.

In our example, the required reserve ratio is 10 percent. If reserves increase by \$100, checkable deposits must rise to \$1000 in order for total required reserves also to increase by \$100. If the increase in checkable deposits is less than this, say, \$900, then the increase in required reserves of \$90 remains below the \$100 increase in reserves, so there are still

excess reserves somewhere in the banking system. The banks with the excess reserves will now make additional loans, creating new deposits, and this process will continue until all reserves in the system are used up. This occurs when checkable deposits have risen to \$1000.

We can also see this by looking at the T-account of the banking system as a whole (including the Commercial Bank) those results from this process:

BANKING SYSTEM			
Assets		Liabilities	
Securities	-\$100	Checkable deposits	+\$1000
Reserves	+\$100		
Loans	+\$1000		

The procedures of eliminating excess reserves by loaning them out means that the banking system (Commercial Bank and Wegagen, Awash, Dashen, Abyssinia, and so on) continues to make loans up to the \$1000 amount until deposits have reached the \$1000 level. In this way, \$100 of reserves supports \$1000 (ten times the quantity) of deposits.

Critique of the Simple Model

Dear learner! Our model of multiple deposit creation seems to indicate that the Central Bank is able to exercise complete control over the level of checkable deposits by setting the required reserve ratio and the level of reserves. The actual creation of deposits is much less mechanical than the simple model indicates. If proceeds from Wegagen's \$90 loan are not deposited but are kept in cash, nothing is deposited in Awash International Bank and the deposit creation process stops & dead in its tracks. The total increase in checkable deposits is only \$100-considerably less than the \$1,000 we calculated. So if some proceeds from loans are used to raise the holdings of currency, checkable deposits will not increase by as much as our streamlined model of multiple deposit creation tells us.

Another situation ignored in our model is one in which banks do not make loans or buy securities in the full amount of their excess reserves. If Wegagen Bank decides to hold on to

all \$90 of its excess reserves, no deposits would be made in Awash International Bank, and this would also stop the deposit creation process. The total increase in deposits would again be only \$100 and not the \$1000 increase in our example. Hence if banks choose to hold all or some of their excess reserves, the full expansion of deposits predicted by the simple model multiple deposits creation does not occur.

Our examples rightly indicate that the Central Bank is not the only player whose behavior influences the level of deposits and therefore the money supply. Banks' decisions regarding the amount of excess reserves they wish to hold and depositors' decisions regarding how much currency to hold can cause the money supply to change. In the next section we stress the behavior and interactions of the four players in constructing a more realistic model of the money supply process.

4.4 Money Supply Model and The Money Multiplier

Dear distance learners! We have already developed a simple model of multiple deposit creation that showed how the Central Bank can control the level of checkable deposits by setting the required reserve ratio and the level of reserves. Unfortunately for the Central Bank, life isn't that simple; control of the money supply is far more complicated. Our critique of this model indicated that decisions by depositors about their holdings of currency and by banks about their holdings of excess reserves also affect the money supply. To deal with these criticisms, in this section we develop a money supply model in which depositors and banks assume their important roles. The resulting framework provides an in-depth description of the money supply process to help you understand the complexity of the Central Bank's role.

To simplify the analysis, we separate the development of our model into several steps. First, because the central bank can exert more precise control over the monetary base (currency in circulation plus total reserves in the banking system) than it can control over total reserves alone, our model links changes in the money supply to changes in the monetary base. This link is achieved by deriving a **money multiplier** (a ratio that relates the change in the money supply to a given change in the monetary base). Finally, we examine the determinants of the money multiplier.

In deriving a model of the money supply process, we focus here on a simple definition of money (currency plus checkable deposit), which corresponds to M1 (you can refer chapter one). Although other broader definitions of money are frequently used in policymaking, particularly M2, conduct the analysis with an M1 definition because it is less complicated and yet provides a basic understanding of the money supply process. Furthermore, all analyses and results using the M1 definition apply equally well to the M₂ definition.

Because, as we saw at the beginning of this Chapter, the Central Bank can control the monetary base better than it can control reserves, it makes sense to link the money supply M to the monetary base MB through a relationship such as the following:

$$M = m \times MB \dots\dots\dots (4.8)$$

The variable ***m*** is the money multiplier, which tells us how much the money supply changes for a given change in the monetary base. This multiplier tells us what multiple of the monetary base is transformed into the money supply. Because the money multiplier is larger than 1, the alternative name for the monetary base, high-powered money, is logical; a \$1 change in the monetary base leads to more than a \$1 change in the money supply.

The money multiplier reflects the effect on the money supply of other factors besides the monetary base, and the following model will explain the factors that determine the size of the money multiplier. Depositors' decisions about their holdings of currency and checkable deposits are one set of factors affecting the money multiplier. Another involves the reserve requirements imposed by the Central bank on the banking system. Banks' decisions about excess reserves also affect the money multiplier.

Deriving the Money Multiplier

In our model of multiple deposit creation above, we ignored the effects on deposit creation of changes in the public's holdings of currency and banks' holdings of excess reserves. Now we incorporate these changes into our model of the money supply process by assuming that the desired level of currency C and excess reserves ER grows proportionally with checkable deposits D; in other words, we assume that the ratios of these items to checkable deposits are constants in equilibrium:

$\{C/D\}$ = currency ratio

$\{ER/D\}$ = excess reserves ratio

where the braces indicate that we are treating the ratio as a constant in equilibrium.

We will now derive a formula that describes how the currency ratio desired by depositors, the excess reserves ratio desired by banks; and the required reserve ratio set by the Central Bank affect the multiplier m . We begin the derivation of the model of the money supply with the equation

$$R = RR + ER \dots\dots\dots (4.9)$$

which states that the total amount of reserves in the banking system R equals the sum of required reserves RR and excess reserves ER . (Note that this equation corresponds to the equilibrium condition $RR = R$ in equation 3, where excess reserves were assumed to be zero.).

The total amount of required reserves equals the required reserve ratio r_D times the amount of checkable deposits D :

$$RR = r_D \times D \dots\dots\dots (4.10)$$

Substituting $r_D \times D$ for RR in the first equation yields an equation that links reserves in the banking system to the amount of checkable deposits and excess reserves they can support:

$$R = (r_D \times D) + ER \dots\dots\dots (4.11)$$

A key point here is that the Central Bank sets the required reserve ratio r_D to be less than 1. Thus \$1 of reserves can support more than \$1 of deposits, and the multiple expansions of deposits can occur.

Let's see how this works in practice. If excess reserves are held at zero ($ER = 0$), the required reserve ratio is set at $r_D = 0.10$, and the level of checkable deposits in the banking system is \$800 billion, the amount of reserves needed to support these deposits is \$80 billion ($= 0.10 \times \$800$ billion). The \$80 billion of reserves can support ten times this amount in checkable deposits because multiple deposit creation will occur.

Because the monetary base (MB) equals currency C plus reserves R , we can generate an

equation that links the amount of monetary base to the levels of checkable deposits and currency by adding currency to both sides of the equation:

$$MB = R + C = (r_D \times D) + ER + C \dots \dots \dots (4.12)$$

Another way of thinking about this equation is to recognize that it reveals the amount of the monetary base that is needed to support the existing amounts of checkable deposits, currency, and excess reserves.

An important feature of this equation is that an additional dollar of MB that arises from an additional dollar of currency does not support any additional deposits. This occurs because such an increase leads to an identical increase in the right-hand side of the equation with no change occurring in D. The currency component of MB does not lead to multiple deposit creation as the reserves component does. Put another way, ***an increase in the monetary base that goes into currency is not multiplied, whereas an increase that goes into supporting deposits is multiplied.***

Another important feature of this equation is that an additional dollar of MB that goes into excess reserves ER does not support any additional deposits or currency. The reason for this is that when a bank decides to hold excess reserves, it does not make additional loans, so these excess reserves do not lead to the creation of deposits. Therefore, if the central bank injects reserves into the banking system and they are held as excess reserves, there will be no effect on deposits or currency and hence no effect on the money supply. In other words, you can think of excess reserves as an idle component of reserves that are not being used to support any deposits. This means that for a given level of reserves, a higher amount of excess reserves implies that the banking system in effect has fewer reserves to support deposits.

To derive the money multiplier formula in terms of the currency ratio $\{C/D\}$ and the excess reserves ratio $\{ER/D\}$, we rewrite the last equation, specifying C as $\{C/D\} \times D$ and ER as $\{ER/D\} \times D$:

$$MB = (r_D \times D) + (\{ER/D\} \times D) + (\{C/D\} \times D) = (r_D + \{ER/D\} + \{C/D\}) \times D$$

We next divide both sides of the equation by the term inside the parentheses to get an

expression linking checkable deposits D to the monetary base MB :

$$D = \frac{1}{r_D + \{ER/D\} + \{C/D\}} \times MB \dots\dots\dots (4.13)$$

Using the definition of the money supply as currency plus checkable deposits ($M = D + C$) and again specifying C as $\{C/D\} \times D$,

$$M = D + (\{C/D\} \times D) = (1 + \{C/D\}) \times D$$

Substituting in this equation the expression for D from Equation 4.13, we have

$$M = \frac{1 + \{C/D\}}{r_D + \{ER/D\} + \{C/D\}} \times MB \dots\dots\dots (4.14)$$

Finally, we have achieved our objective of deriving an expression in the form of our earlier *Equation 4.8*. As you can see, the ratio that multiplies MB is the money multiplier that tells how much the money supply changes in response to a given change in the monetary base (high-powered money). The money multiplier m is thus

$$m = \frac{1 + \{C/D\}}{r_D + \{ER/D\} + \{C/D\}} \dots\dots\dots (4.15)$$

and it is a function of the currency ratio set by depositors $\{C/D\}$, the excess reserves ratio set by banks $\{ER/D\}$, and the required reserve ratio set by the Central bank r_D .

Although the algebraic derivation we have just completed shows you how the money multiplier is constructed, you need to understand the basic intuition behind it in order to be able to understand & apply the money multiplier concept without having to memorize it.

Intuition behind the Money Multiplier

Dear distance learners! To get a feel for what the money multiplier means, let us again construct a numerical example with realistic numbers for the following variables:

r_D = required reserve ratio = 0.10

C = currency in circulation = \$400 billion

D = checkable deposits = \$800 billion

ER = excess reserves = \$0.8 billion

M = money supply (M1) = C + D = \$1200 billion

From these numbers we can calculate the values for the currency ratio {C/D} and the excess reserves ratio {ER/D}:

$$\{C / D\} = \frac{\$ 400 \text{ billion}}{\$ 800 \text{ billion}} = 0.5 \qquad \{ER / D\} = \frac{\$ 0.8 \text{ billion}}{\$ 800 \text{ billion}} = 0.001$$

The resulting value of the money multiplier is

$$m = \frac{1 + 0.5}{0.1 + 0.001 + 0.5} = \frac{1.5}{0.601} = 2.5$$

The money multiplier of 2.5 tells us that given the required reserve ratio of 10 percent on checkable deposits and the behavior of depositors as represented by {C/D} = 0.5 and banks as represented by {ER/D} = 0.001, a \$1 increase in the monetary base leads to a \$2.50 increase in the money supply (M1).

An important characteristic of the money multiplier is that it is less than the simple deposit multiplier of 10 found at the beginning of this Chapter. The key to understanding this result and our money supply model is to realize that **although there are multiple expansions of deposits, there is no such expansion for currency**. Thus, if some portion of the increase in high-powered money finds its way into currency, this portion does not undergo multiple deposit expansion. In our analysis in this Chapter, we did not allow for this possibility, and so the increase in reserves led to the maximum amount of multiple deposit creation. However, in our current model of the money multiplier, the level of currency does increase when the monetary base MB and checkable deposits D increase because {C/D} is greater than zero. As previously stated, any increase in MB that goes into an increase in currency is not multiplied, so only part of the increase in MB is available to support checkable deposits that undergo multiple expansions. The overall level of multiple deposit expansion must be lower, meaning that the increase in M given an increase in MB is smaller than the simple model indicated at the beginning of this chapter.

4.5 Factors that determine the money multiplier

Dear distance learners! To develop our intuition of the money multiplier even further, let us look at how this multiplier changes in response to changes in the variables in our model: $\{C/D\}$, $\{ER/D\}$, and r_D . The "game" we are playing is a familiar one in economics: We ask what happens when one of these variables changes, leaving all other variables the constant (*ceteris paribus*).

1. Changes in the Required Reserve Ratio (r_D)

If the required reserve ratio on checkable deposits increases while all the other variables stay the same, the same level of reserves cannot support as large an amount of checkable deposits; more reserves are needed because required reserves for these checkable deposits have risen. The resulting deficiency in reserves then means that banks must contract their loans, causing a decline in deposits and hence in the money supply. The reduced money supply relative to the level of MB, which has remained unchanged, indicates that the money multiplier has declined as well. Another way to see this is to realize that when r_D is higher, less multiple expansions of checkable deposits occur. With less multiple deposit expansion, the money multiplier must fall.

We can verify that the foregoing analysis is correct by seeing what happens to the value of the money multiplier in our numerical example when r_D increases from 10 percent to 15 percent (leaving all the other variables unchanged). The money multiplier becomes

$$m = \frac{1 + 0.5}{0.15 + 0.001 + 0.5} = \frac{1.5}{0.651} = 2.3$$

which, as we would expect, is less than 2.5.

The analysis just conducted can also be applied to the case in which the required reserve ratio falls. In this case, there will be more multiple expansion for checkable deposits because the same level of reserves can now support more checkable deposits, and the money multiplier will rise. For example, if r_D falls from 10 percent to 5 percent, plugging this value into our money multiplier formula (leaving all the other variables unchanged) yields a money multiplier of

$$m = \frac{1+0.5}{0.05 + 0.001 + 0.5} = \frac{1.5}{0.551} = 2.72$$

which is above the initial value of 2.5.

We can now state the following result: ***The money multiplier and the money supply are negatively related to the required reserve ratio r_D .***

2. Changes in the Currency Ratio {C/D}

Next, what happens to the money multiplier when depositors' behavior causes {C/D} to increase with all other variables unchanged? An increase in {C/D} means that depositors are converting some of their checkable deposits into currency. As shown before; checkable deposits undergo multiple expansions while currency does not. Hence when checkable deposits are being converted into currency, there is a switch from a component of the money supply that undergoes multiple expansion to one that does not. The overall level of multiple expansion declines, and so must the multiplier.

This reasoning is confirmed by our numerical example, where {C/D} rises from 0.50 to 0.75. The money multiplier then falls from 2.5 to

$$m = \frac{1+0.75}{0.1+0.001+0.75} = \frac{1.75}{0.851} = 2.06$$

We have now demonstrated another result: ***The money multiplier and the money supply are negatively related to the currency ratio {C/D}.***

3. Changes in the Excess Reserves Ratio {ER/D}

When banks increase their holdings of excess reserves relative to checkable deposits, the banking system in effect has fewer reserves to support checkable deposits. This means that given the same level of MB banks will contract their loans, causing a decline in the level of checkable deposits and a decline in the money supply, and the money multiplier will fall.

This reasoning is supported in our numerical example when {ER/D} rises from 0.001 to 0.005. The money multiplier declines from 2.5 to

$$m = \frac{1+0.5}{0.1+0.005+0.5} = \frac{1.5}{0.605} = 2.48$$

Note that although the excess reserves ratio has risen, there has been only a small decline in the money multiplier. This decline is small because in recent years the {ER/D} ratio has been extremely small, so changes in it have only a small impact on the money multiplier. However, there have been times, particularly during the Great Depression, when this ratio was far higher, and its movements had a substantial effect on the money supply and the money multiplier. Thus our final result is still an important one: ***The money multiplier and the money supply are negatively related to the excess reserves ratio {ER/D}.***

Chapter Four: Review Questions

Part I: Choose a single best answer for the following questions

- 1) If the national bank of Ethiopia sells securities worth of 2 million birr to the Bank which one of the following **CANNOT** be concluded from the above transaction?
 - A) The national bank's monetary base increases by 2 billion birrs
 - B) The above action of national bank doesn't change the level of reserves
 - C) In the asset part of the national bank of Ethiopia, the reserve amount increases by 2 million birrs
 - D) In the liability part of the Banking system, the security amount increases by 2 million birrs
 - E) All of the above

- 2) If Mr. Dawit sold 500 Birr of bond to the Central bank and cashes the Central bank's check at Lion bank for currency, which one of the following is **TRUE**?
 - A) Lion bank credits the Mr. Dawit's account with 500 birrs
 - B) Monetary base increases by 500 birrs due to the increment of reserve by 500 birrs
 - C) There is no checkable deposit impact in the banking system
 - D) Currency in circulation decreases by the 500 birrs of the open market purchase
 - E) All of the above

- 3) If the required reserve ratio is one-fourth, currency in circulation is Birr 400 billion, and checkable deposits are Birr 1600 billion, then the monetary base is
- a. Birr 1800 billion.
 - b. **Birr 800 billion.**
 - c. Birr 3,200 billion
 - D) Birr 333 billion.
 - E) Birr 667 billion.
- 4) Which of the following statement is **INVALID**?
- A) Discount rate on reserve Monetary base is determined by central bank
 - B) The general public determine the demand deposit
 - C) Commercial bank determines excess reserve amount
 - D) **Money is fully policy determined variable**
 - E) None of the above
- 5) **Except one**, all of the following statement are correct
- A) **If the NBE proceed it OMO purchase in deposit, the purchase decreases the reserve**
 - B) If the NBE proceed it OMO purchase in currency, the purchase decreases the reserve
 - C) If the NBE proceed it OMO purchase in currency/ deposit , the purchase has effect on monetary base
 - D) The impact of OMO purchase on reserve is much more uncertain than the monetary.
 - E) All of the above
- 6) Which one of the following is **NOT** registered at the liability part of central bank balance sheet?
- A) Government reserve
 - B) **International reserves**
 - C) Bank notes & coins
 - D) Banks reserve
 - E) All of the above

Part II: Give a short and precise answer for the following questions

- 7) The National Bank of Ethiopia (NBE) has bought the 500-birr bond from the Commercial Bank of Ethiopia (CBE), the CBE finds that it has an increase in reserves of 500 Birr.
- A) If the CBE decides to make a loan equal amount to the 500 birrs increase in excess reserves by opening a checking account for the borrower, what the resulting T-account of the CBE look like?
 - B) Assume the 500 birrs of deposits created by CBE's loan is deposited at Wegagen Bank. What the Wegagen Bank T-account become?
 - C) Assume Wegagen Bank doesn't want to hold excess reserve, and make loans for the entire amount at 10 percent required reserve ratio. Show the resulting wegagen's bank T- account?
- 8) The hypothetical country's currency, reserve and deposit values are given in the following way
- C=200 billion birrs**
 - D=1000 billion birrs**
 - RR=200 billion birrs**
 - ER= 20 billion birrs, calculate**
- A) The value of money multiplier
 - B) Interpret the result you get in 'A'
 - C) How much of monetary base we need to support the existing money supply (M1)?

Chapter Five

Central Banking and Monetary Policy

Introduction

Dear distance learners! Understanding the conduct of monetary policy is important, because it not only affects the money supply in the market but also has a major influence on the level of economic activity and hence on overall well-being of society. To explore this subject, we look at the goals, tools, targets and indicators that the Central Bank establishes for the working of monetary policy and its strategies for attaining them.

Dear learners! After the completion of this chapter you are expected to understand and be able to explain:

- ✓ The role that central banks play in financial markets and the overall economy
- ✓ Organization and Independence of Central banks
- ✓ The goals of monetary policy
- ✓ The conduct of monetary policy
- ✓ The interactions b/n the monetary and real Sectors: The transmission Mechanism in the Classical, Keynesian, and Monetarist Models
- ✓ Effectiveness of Monetary and Fiscal policies in the Classical, Keynesian, and Monetarist models
- ✓ Empirical evidence on the transmission mechanism of monetary policy

5.1. Central Banking and the functions of the Central Bank

Dear distance learners! There is a common agreement among scholars that the most important players in financial markets throughout the world are Central Banks, also called the government authorities in charge of the working of monetary policy.

Central Banks are relatively new inventions. An American President (Andrew Jackson) even cancelled his country's Central Bank in the nineteenth century because he did not think that it was that important. But things have changed since then. Today, Central Banks are the most important feature of the financial systems of all countries of the world. Central

Banks are bizarre hybrids. Some of their functions are identical to the functions of regular commercial banks. Other functions are unique to the Central Bank. On certain functions this bank has an absolute legal monopoly.

The Central Bank's actions affect interest rates, the amount of credit, and the money supply, all of which have direct impact not only on financial markets but also on the aggregate output of the economy. Though the government authorities may propose policies related to money, it is the Central Bank which is assigned to manage them. Thus, monetary policy is also called as The Central Bank Policy.

 ***What do you think are the main activities that we expect the Central Bank to accomplish? Please try to list a few of them in the following lines.***

The following are believed to be the main activities of the Central Bank:

1. **Bank of note issue:** the central bank has a sole monopoly of note issue in almost every country. The currency notes printed and issued by the central bank become unlimited legal tender throughout the country.

 ***What advantage do you expect by delivering monopoly power of note issue to one institution (i.e central bank)?***

The main advantages of giving the monopoly rights of note issue to the central bank are given below:

- ✓ It gives uniformity in the monetary system of note issue and note circulation
- ✓ The central bank can exercise better control over the money supply in the country
- ✓ It increases public confidence in the monetary system of the country
- ✓ The central bank can earn profit through the issue of paper currency
- ✓ It may avoid political interference in the matter of note issue...etc

2. Banker, agent and advisor to the government

As a banker to the government: the central bank performs the same functions for the government as the commercial bank performs for its customers. It maintain the accounts of the federal as well as regional governments; it receives deposits from the government; it

makes short term advances to the government; it provide foreign exchange resources for the government to repay external debt or purchasing foreign goods and services

As an agent to the government: the central bank collects taxes and other payments on behalf of the government. It raises loan from the public and thus manage public debt.

As a financial advisor to the government: the central bank gives advice to the government on economic, monetary, financial and fiscal matters such as

- Deficit financing
- Devaluation
- Foreign exchange policy...etc.

3. **Bankers bank:** it controllers the other commercial banks with in the country. Dear students all the profit-oriented government and private banks fall in one basket and usually called commercial banks. The central bank gives loan in times of acute liquidity problem by the commercial banks. In this way the central bank acts as a friend, philosopher and guide to the commercial banks.

4. Custodian of foreign exchange reserves

The central bank also functions as custodian of country's foreign exchange reserves. This function helps the economy to overcome the balance of payment difficulties and to maintain stability in exchange rate. In order to minimize the fluctuation in the foreign exchange rates, the central bank buys (sells) foreign currency in the market when the exchange rate falls (rise) respectively.

5. Controller of credit

Controlling of credit is the most important function of the central banks. By controlling credit effectively, the central bank establishes internal (price) and external (foreign exchange rate) balances. Such stabilities are necessary for economic growth and smooth functioning of the economy.

6. Developmental role

In addition to the above functions, the central bank performs developmental functions. The central bank helps to develop money and capital markets and undertake suitable measure to promote growth.

More generally, a nation's principal monetary authority, such as the Central Federal Reserve Bank (USA), the Deutsche Bundesbank (Germany), and National Bank of Ethiopia (Ethiopia), regulates the money supply and credit, issues currency, and manages the rate of exchange. It is the entity responsible for overseeing the monetary system for a nation (or group of nations). Central Banks have a wide range of responsibilities – from overseeing monetary policy to implementing specific goals such as currency stability, low inflation and full employment. Central Banks also generally function as the bank of the government, regulate the credit system, oversee commercial banks, manage exchange reserves and act as a lender of last resort.

5.2. Central bank independence



Dear learners! Why is Central Bank independence in monetary policy an important one for proper functioning of the Central Bank?

The very short and precise answer to this question is that price stability is generally considered a good thing, and that an independent Central Bank can help to achieve it. We do not need to dwell on the desirability of price stability. Economies work better if investment and wage decisions are not confused and thwarted by high inflation. Some people see price stability as an anchor not only for the economy, but also for the society at large.

Dear distance learners! Once we agree on the rationale for Central Bank independence, we need to have a common understanding on *‘What is Central Bank independence all about?’*

In principle, Central Bank independence relates to giving Central Banks a charter which includes a strong commitment to price stability and the freedom to pursue it. Stanley Fischer, who was a professor at MIT (Michigan Institute of Technology) and then the Deputy Managing Director of the International Monetary Fund, has defined two different types of independence of Central Banks: *instrument independence*, the ability of the Central Bank to set monetary policy instruments, and *goal independence*, the ability of the Central Bank to set the goals of monetary policy.

Normally the governing body in a nation is not something to forget. The issue does involve the government in setting the goals, and that is the way it should be: Central Banks cannot expect to determine the goals they pursue, but they should have adequate scope to pursue the goals that have been set. In the jargon, they should not have goal independence but instrument independence. Probably even more important to its independence from the whims of government is the bank's independent and substantial source of revenue from its holdings of securities and, to a lesser extent, from its loans to banks.

On the other side of the coin, there is a counter argument about strive for Central Bank independence (supporters of dependence of central banks on government). Some Economics scholars would love to argue that the general public holds the government responsible for the economic wellbeing of the country, yet if it lacks control over the government agency that may well be the most important factor in determining the health of the economy, it is a worthless blame. In addition, to achieve a cohesive program that will promote economic stability, monetary policy must be coordinated with fiscal policy (management of government spending and taxation). Only by placing monetary policy under the control of the politicians who also control fiscal policy can these two policies be prevented from working at cross-purposes.

There is yet no consensus on whether Central Bank independence is a good thing, although public support for independence of the Central Bank seems to have been growing in both the developed and developing world. As you might expect, people who like the bank's policies are more likely to support its independence, while those who dislike its policies advocate a less independent Central Bank.

Advocates of an independent Central Bank believe that macroeconomic performance will be improved by making the Central Bank more independent. Recent research seems to support this conjecture: When Central Banks are ranked from least independent to most independent; inflation performance is found to be the best for countries with the most independent Central Banks. Although a more independent Central Bank appears to lead to a lower inflation rate, this is not achieved at the expense of poorer real economic performance. Countries with independent Central Banks are no more likely to have high

unemployment or greater output fluctuations than countries with less independent Central Banks.

As to the prediction about the strength of Central Bank Independence, several surveys on the structure and independence of the major Central Banks indicates a remarkable trend toward increasing independence.

In the next topics, we discuss the basic issues of conducting monetary policy. It is usual that for our bullet (tools) not to be a waste, there should be a goal to shoot at. Similarly, in order to undertake or conduct monetary policy, it is mandatory first to discuss goals that are expected to be met.

5.3. Goals of Monetary Policy

The Central Bank's monetary policy sets its goals first and draws strategies or instruments to achieve these goals. The objectives of monetary policy may be divided into several levels. Commonly speaking, however, there are three levels of monetary policy objectives:

1. *Ultimate (primary) objectives:* - these are the goals of monetary policy.
2. *Intermediate objectives:* - these relate to the desirable levels and changes in the major monetary variables in order to achieve the desirable levels of the primary objectives. For example, the intermediate objectives of the Central Bank include achieving the desired levels of money supply and overall credit and a certain structure of the interest rates in the economy.
3. *Immediate objectives:* - these are the operational targets the Central Bank seeks to achieve directly through the policy tools at its disposal. They include the monetary base, the reserves held by the commercial banks, the discount rate or the bank rate charged on loans to the commercial banks, and the treasury bills rate & other selected market rates of interest.



Dear distance learner! Do you know the difference between goals, targets, and indicators? Explain it?

The appropriateness of the immediate and intermediate objectives has to be examined in terms of the relationship to the ultimate objectives, which are usually those of full

employment and high growth rate. Reliance on a broader range of objectives at each of the two lower levels is a necessary act. There are several basic goals which are continually pursued by the Central Bank. Six basic goals are continually mentioned by personnel at the Central Bank:

- 1. Price stability,*
- 2. High employment,*
- 3. Economic growth,*
- 4. Interest rate stability,*
- 5. Stability of financial markets, and*
- 6. Stability in foreign exchange markets*

1. Price stability: - price stability is desirable because a rising price level (inflation) creates uncertainty in the economy. For example, the information contained in the prices of goods and services is harder to interpret when the overall level of prices is changing, and hence decision making by consumers, businesses, and government can become difficult.

Over the past few decades, policymakers in the developed world have become increasingly aware of the social and economic costs of inflation and more concerned with a stable price level as a goal of economic policy. Indeed, price stability is increasingly viewed as the most important goal for monetary policy.

Price stability is desirable because a rising price level (inflation) creates uncertainty in the economy, and that uncertainty might hamper economic growth. For example, when the overall level of prices is changing, the information conveyed by the prices of goods and services is harder to interpret, which complicates decision making for consumers, businesses, and government. Not only do public opinion surveys indicate that the public is very hostile to inflation, but a growing body of evidence suggests that inflation leads to lower economic growth. The most extreme example of unstable prices is hyperinflation, such as Argentina, Brazil, and Russia have experienced in the recent past [Let me leave it to your intuitive judgment about that of Ethiopia].

Many economists attribute the slower growth that the countries have experienced to their problems with hyperinflation. Inflation also makes it hard to plan for the future. For example, it is more difficult to decide how much funds should be put aside to provide for a child's college education in an inflationary environment. Further, inflation can strain a country's social fabric: Conflict might result, because each group in the society may compete with other groups to make sure that its income keeps up with the rising level of prices.



Dear distance learners! Please discuss with your acquaintances on the current inflationary situation of Ethiopia! Its reasons and effects!

Dear learners! It is worth noting that the goal of price stability is not meant to be an end in itself! It is followed in the belief that price stability fosters growth, so that a low target rate of inflation is meant to provide the monetary conditions that will produce the highest long-run growth of output and the lowest long-run unemployment for the economy. The target of price stability is also meant to remove or at least minimize the potential of monetary policy to destabilize the economy.

And price stability does not necessitate price stationarity. The latter does not initiate producers to produce more and more. Prices should be allowed to move within manageable range; nevertheless, they should not go out of control of the Central Bank.

2. High employment: - High employment is a worthy goal for two main reasons:

- A. The alternative situation—high unemployment—causes much human misery, with families suffering financial distress, loss of personal self-respect, and increase in crime (though this last conclusion is highly controversial), and
- B. When unemployment is high, the economy has not only idle workers but also idle resources (closed factories and unused equipment), resulting in a loss of output (lower GDP).

Although it is clear that high employment is desirable, how high should it be? At what point can we say that the economy is at full employment? At first, it might seem that full employment is the point at which no worker is out of a job; that is, when unemployment is

zero. But this definition ignores the fact that some unemployment, called frictional unemployment, which involves searches by workers and firms to find suitable matchups, is beneficial to the economy. Some level of unemployment is always there (unavoidable) of different reasons:

- ✓ Because some social security benefits are there, people may decide to be voluntarily unemployed. (Voluntary unemployment).
- ✓ Because new technologies are introduced, people may become unemployed or chased out of their jobs (technological unemployment).
- ✓ Because of the dynamic nature of economies and information imperfection, people may become unemployed (frictional unemployment).

Let's synthesize the point using the following hypothetical example. Suppose a worker who decides to look for a better job might be unemployed for a while during the job search. Workers often decide to leave work temporarily to pursue other activities (raising a family, travel, returning to school), and when they decide to reenter the job market, it may take some time for them to find the right job.

Another reason that unemployment is not zero when the economy is at full employment is due to what is called *structural unemployment*, a mismatch between job requirements and the skills or availability of local workers. Clearly, this kind of unemployment is undesirable. Nonetheless, it is something that monetary policy can do little about. The goal for high employment should therefore not seek an unemployment level of zero but rather a level above zero consistent with full employment at which the demand for labor equals the supply of labor. This level is called the **natural rate of unemployment**.

Although this definition sounds neat and authoritative, it leaves a troublesome question unanswered: What unemployment rate is consistent with full employment? On the one hand, in some cases, it is obvious that the unemployment rate is too high: The unemployment rate in excess of 20% during the Great Depression, for example, was clearly far too high. In the early 1960s, on the other hand, policymakers thought that a reasonable goal was 4%, a level that was probably too low, because it led to accelerating inflation.

Current estimates of the natural rate of unemployment place it between 4 and 6%, but even this estimate is subject to a great deal of uncertainty and disagreement.

In addition, it is possible that appropriate government policy, such as the provision of better information about job vacancies or job training programs, might decrease the natural rate of unemployment.

In short, the goal of high employment should not seek an unemployment level of zero, but rather, a level above zero consistent with full employment at which the demand for labor equals the supply of labor (the so called the natural rate of unemployment).

3. *Economic growth:* - The goal of steady economic growth is closely related to the high-employment goal because businesses are more likely to invest in capital equipment to increase productivity and economic growth when unemployment is low. Conversely, if unemployment is high and factories are idle, it does not pay for a firm to invest in additional plants and equipment. Although the two goals are closely related, policies can be specifically aimed at promoting economic growth by directly encouraging firms to invest or by encouraging people to save, which provides more funds for firms to invest. In fact, this is the stated purpose of so-called supply-side economics policies, which are intended to spur economic growth by providing tax incentives for businesses to invest in facilities and equipment and for taxpayers to save more. There is also an active debate over what role monetary policy can play in boosting growth.

4. *Interest-rate stability:* - This is desirable because fluctuations in interest rates can create uncertainty in the economy and make it harder to plan for the future. Fluctuations in interest rates that affect consumers' willingness to buy houses, for example, make it more difficult for consumers to decide when to purchase a house and for construction firms to plan how many houses to build. A Central Bank may also want to reduce upward movements in interest rates for the reasons that upward movements in interest rates generate hostility toward Central Banks like and lead to demands that their power be curtailed.

- 5. *Stability of financial markets:*** - one way the Central Bank promotes financial stability is by helping prevent financial panics through its role as lender of last resort. The stability of financial markets is also promoted by interest rate stability since fluctuations in interest rates create uncertainty for financial institutions. An increase in interest rates produces large capital losses on long-term bonds and mortgages, losses that can cause the failure of the financial institutions holding them. In recent years, more pronounced interest-rate fluctuations have been a particularly severe problem for savings and loan associations and mutual savings banks, many of which got into serious financial trouble in the 1980s and early 1990s. Financial crises can interfere with the ability of financial markets to channel funds to people with productive investment opportunities, thereby leading to a sharp contraction in economic activity. The promotion of a more stable financial system in which financial crises are avoided is thus an important goal for a Central Bank.
- 6. *Stability in foreign exchange markets:*** - With the increasing importance of international trade to the U.S. economy, the value of the dollar relative to other currencies has become a major consideration for the Central Bank. A rise in the value of the dollar makes American industries less competitive with those abroad, and declines in the value of the dollar stimulate inflation in the United States. In addition, preventing large changes in the value of the dollar makes it easier for firms and individuals purchasing or selling goods to other countries to plan ahead. Stabilizing extreme movements in the value of the dollar in foreign exchange markets is thus viewed as a worthy goal of monetary policy. In other countries, which are even more dependent on foreign trade, stability in foreign exchange markets takes on even greater importance.

Conflicts among Objectives

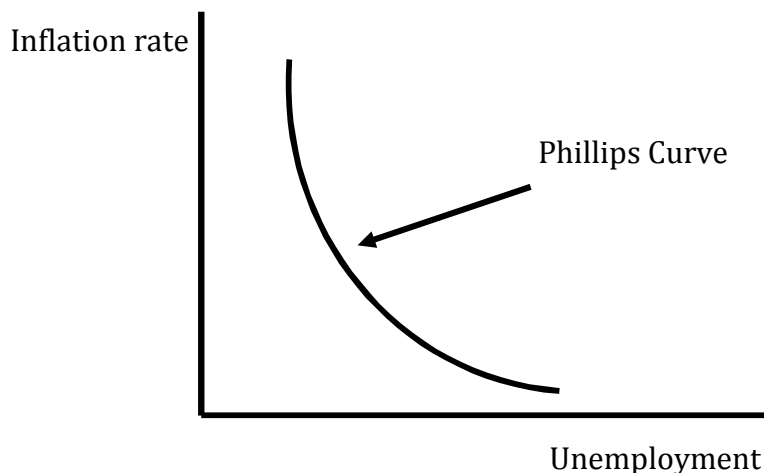
Dear distance learners! The Central Bank tries to optimize the goals of monetary policy but cannot achieve them all simultaneously. Conflicts among goals are always there. In the short run, depending on conditions, focuses should be made on one or two. Although many of the goals mentioned are consistent with each other such as high employment with economic growth, interest rate stability with financial market stability- this is not always

the case. The goal of price stability often conflicts with the goals of interest-rate stability and high employment in the short run (but probably not in the long run). For example, when the economy is expanding and unemployment is falling, both inflation and interest rates may start to rise. If the Central Bank tries to prevent a rise in interest rates, this might cause the economy to overheat and stimulate inflation. But if a Central Bank raises interest rates to prevent inflation, in the short run unemployment could rise. The conflict among goals may thus present Central Banks with some hard choices.

We may discuss some of the very visible conflicts among the goals in the following manner.

1. The conflict between price stability and high employment: - in most cases, both cannot be achieved simultaneously. One is achieved at the cost of the other. Huge spending may be made to create more jobs. But more spending means more aggregate demand in the economy which will not be satisfied shortly because the Inflation expansion of production capacity requires time. This is explained by the Phillips curve (the inverse relationship between inflation and unemployment).

Fig. 5.1: The Phillips curve



- ✓ The problem is the gap between aggregate demand and aggregate supply.

In least developed countries (LDCs), the main problem is the rigidity of the labor market, which results in less mobility of labor. In any case, which is a more acute problem will determine the focus to be given.

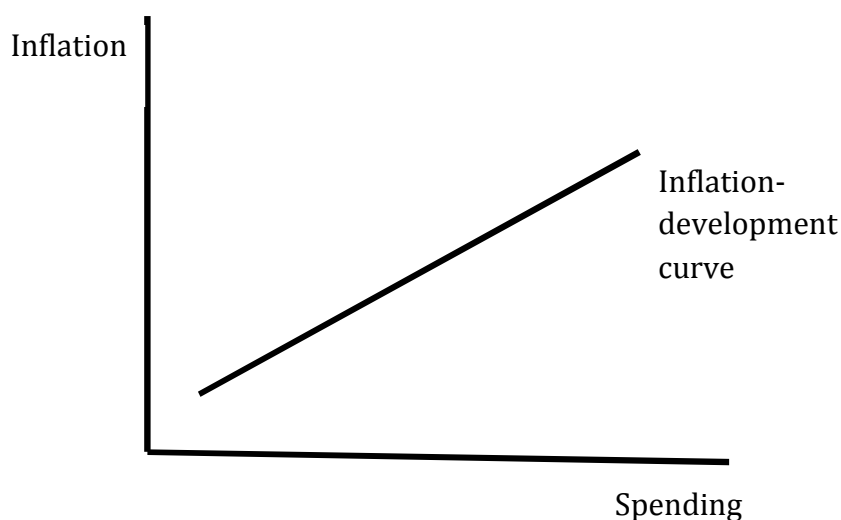


Dear distance learners! Do you think that the Phillips curve analysis is applicable in the LDCs economic setup?

In answering this question, you may raise issues like administered prices and imported inflation.

2. The conflict between development and inflation: - with development there is an increase in investment spending which in turn, leads to rises in general prices (inflation). Graphically:

Figure 5.2: Inflation-Development Curve



In the long run, the objective should be money neutrality at the maximum possible feasible output; i.e. the maximization of output and increase in money supply should not lead to increase in general price level.

5.4. Tools of Monetary Policy

Dear learners! The Central Bank designs a specific strategy to hit its goal by aiming at targets rather than by aiming at the goal directly. That is by using intermediate and operating targets, it can more quickly judge whether its policies are on the right track. Yet the track is not that simple. The bank has to use one or more of the instruments at its disposal. This part is all about these instruments- the kind, the characteristics, and the relative advantage of each of them will be discussed in detail.

The common instruments of monetary policy are generally categorized into two: **the quantitative monetary policy tools and the qualitative monetary policy tools**. The former includes tools such as open market operations (OMOs), variations in reserve requirement rates (RRR), and changes in discount rates (DR). The latter includes moral suasion and selective controls.

Normally Central Banks do not leave the financial system to be dependent on a single monetary instrument. Instead they make sure that both the quantitative and qualitative tools are used in parallel. The mix of the instruments used depends upon the structure of the economy, especially the financial system, which in turn tends to depend on the stage of development of the bond and stock exchange markets.

5.4.1. Open Market Operations (OMOs)

This monetary tool was invented in the early 1920s in US's Fed. Until 1920, the Fed was generating its income exclusively from the interest it received on the discount loans it made to member banks. After the 1920–1921 recessions, the volume of discount loans shrank dramatically, and the Fed was pressed for income. It solved this problem by purchasing income-earning securities. In doing so, the Fed noticed that reserves in the banking system grew and there was a multiple expansion of bank loans and deposits. This result is OMOs.

To the Fed at that time it was a revelation. By the end of the 1920s, it was the most important weapon in the Fed's arsenal. OMO is the most important monetary policy tool because it is the most important determinant of changes in the monetary base [reserve base in the banking system], the main source of fluctuation in the money supply. It involves the sale and purchase of government securities like treasury bills and bonds. The market in which government securities are bought and sold is called as the Gilt- edged market. Open market purchases (sales) expand (contract) the monetary base, there by rising (reducing) the money supply. To enable OMOs, the Central Bank must hold foreign exchange reserves (usually in the form of government bonds) and official gold reserves. It will often have some influence over any official or mandated exchange rates: In the world, some exchange

rates are managed (fixed), some are market based (free float) and many are somewhere in between managed float" or "dirty float".

Countries with well-developed financial markets and extensive amounts of public debt traded in the financial markets usually rely on such operations to change money supply as their main tool of monetary policy. But this may not always be the case in the developing world since its frequency of use depends on some preconditions to be met. These include:

1. The financial structure of the economy should be well developed with most of the borrowing and lending being done in the organized financial markets of the country itself.
2. There should be a relatively large amount of securities of the kind that the monetary authorities are willing to purchase. These are often government securities. Hence a large public debt is generally essential.
3. The market established priorities must broadly coincide with the politically acceptable priorities. This condition is not always met, as, for example, in a socialist country like Cuba.
4. The financial markets of the country should be broadly independent of those of other countries. Very open economies with perfect capital flows and fixed exchange rates do not possess such independence.

To take an extreme example, different states or regions within a country do not possess an independent financial system and cannot pursue a monetary policy independent of the nation as a whole. Similarly, members of a common currency or monetary bloc with fixed exchange rates among member countries cannot pursue monetary policies independently of that of the bloc. A good case at hand is the European Monetary Union. A less extreme case arises in countries whose financial markets are closely tied to major financial centers outside the country.

Financially underdeveloped economies generally fail to satisfy the first condition. Countries without a strong commitment to free enterprise and capitalism fail to satisfy the 3rd condition. Countries in an economic union, such as the European Union, may not fully meet the 4th condition. Many countries of the world fall into one or more of these categories.

Hence, they pursue other tools of monetary policy to supplement or even to substitute OMOs.

However, we may list down the following as the main advantages of using OMOs as monetary policy tool.

1. OMOs occur at the initiative of the policy maker (the Central Bank), which has complete control over the volume of OMOs. Decisions on when/where to start and stop, how to start and stop, and how much to sell/purchase are at the discretion of the bank.
2. OMOs are flexible. There is no hard and fast rule as to OMOs; they can be used to any degree. No matter how small a change in reserves or the monetary base is desired, OMOs can achieve it with a small purchase or sale of securities.
3. OMOs are easily reversed. When a mistake is committed in conducting OMOs, the Central Bank can immediately reverse its use of this tool. Within a day the bank may make purchases and then sales of securities.
4. OMOs can be implemented quickly. They do not involve any administrative delays. The bureaucratic costs are almost zero with OMOs.

5.4.2. Variations in Reserve Requirements Rates (RRR)

Dear learners! Most of the monetary policy tools were introduced to the world banking system by the US banking system. The variation in RR is not a different one. In the Banking Act of 1935, a rule was developed to allow the Fed to alter reserve requirements without the president's approval. The first use of reserve requirements as a tool of monetary control proved that the Fed was capable of adding to the blunders that it had made during the bank panics of the early 1930s.

Therefore, the imposition of reserve requirements has historically been a common tool of controlling monetary aggregates for a given monetary base. In cases where the markets are too thin for viable OMOs, or if the monetary base cannot be controlled for some reasons, the monetary authorities often attempt to limit the creation of reserves by the banking

system through the imposition of, or changes in, reserve requirement against demand deposits and at times other types of deposits.

When the Central Bank feels that commercial banks have too much (small) liquidity which may lead to inflation (deflation – a situation of too low investment and hence too low production), it will raise (drop) the reserve requirements.

- ✓ *Reserve requirements are there with the objective of building public's confidence on the reliability of commercial banks (their ability of solvency).*

Changes in reserve requirements cause the money supply to change. A rise (decline) in reserve requirements reduces (increases) the amount of deposits that can be supported by a given level of the monetary base and will lead to a contraction (expansion) of the money supply, the expansion arising due to multiple deposit creation.

Dear learners! The main advantage of using reserve requirements to control the money supply is that they affect all banks **equally** and have a **powerful** effect on the money supply. Secondly, it is very effective in its geographic coverage. While OMOs are used only with the local banks (for example the National Bank of Ethiopia and other commercial banks in Addis Ababa), reserve requirements can be applied to all banks in the empire.

- ✓ *The fact that changing reserve requirement is a powerful tool is probably more of a curse than a blessing because small changes in money supply will be hard to engineer by varying reserve requirements. Using reserve requirements to engineer 'fine tuning' adjustments to the money supply is just like trying to use a jackhammer to cut a diamond.*

The other pronounced disadvantage of using reserve requirements to control money supply is that raising the reserve requirement ratio can cause **immediate liquidity problems** for a bank with low excess reserves. Banks can also make reserve requirements ineffective. For example, looking at the excess liquidity, the Central Bank may set higher levels of reserve requirements; however banks may borrow from the Central Bank to maintain their high liquidity. In such a case the policy tool becomes completely ineffective.

- ✓ In most of the cases banks do have negative attitude towards reserve requirements because they consider it as tax on them, because it is something compulsory to them.

There is a considerable variation in reserve requirements among economies. Countries with large oligopolistic banking system tend to have very low (zero in the case of Canada, Switzerland, New Zealand, and Australia!) reserve requirements. In the Western economies, changes in reserve requirements ratio are now either no longer available as an instrument of monetary policy control or are not used in practice for this purpose.

5.4.3. Discount Rate Policy

Dear distance learners! Under this policy the Central Bank rate (discount rate) is what the Central Bank charges on the borrowings [discount loans] which the commercial banks make from it; i.e. it is the rate at which the Central Bank lends to the commercial banks.

The Central Bank facility at which discount loans are made to banks is called the **discount window**. The easiest way to understand how the bank affects the volume of discount loans is by looking at how the discount window operates. The Central Bank's discount loans to banks are of three types: primary credit, secondary credit, and seasonal credit.

Primary credit is the discount lending that plays the most important role in monetary policy. Healthy banks are allowed to borrow all they want from the primary credit facility, and it is therefore referred to as a standing lending facility. The interest rate on these loans is the discount rate, a rate which is set higher than the federal funds rate target, usually by one percentage point, and thus in most circumstances the amount of discount lending under the primary credit facility is very small. Although the rate on the primary securities is a bit higher than the rates on other loans, the facility is intended to be a backup source of liquidity for sound banks so that the federal funds rate never rises too far above the federal funds target.

Secondary credit is given to banks that are in financial trouble and are experiencing severe liquidity problems. The interest rate on secondary credit is set at 0.5 percentage points

above the primary discount rate. This interest rate on these loans is set at a higher, penalty rate to reflect the less-sound condition of these borrowers.

Seasonal credit is given to meet the needs of a limited number of small banks in vacation and agricultural areas that have a seasonal pattern of deposits. The interest rate charged on seasonal credit is tied to the average of the federal funds rate and certificate of deposit rates.

Generally speaking, in most countries in the world, the monetary authority has the power to determine directly/ indirectly the market interest rates in the economy. During inflationary times, the bank raises the bank rate to make credits so expensive that banks would be discouraged to borrow. When the general prices decline abnormally, the bank reduces the rate to encourage banks to take more credits so as to raise the aggregate demand (with the expectation that prices and hence production will increase).

Critical interest rates can be set directly or determined through instructions issued to the commercial banks, or influenced indirectly by the Central Bank varying the rate at which it lends to the commercial banks. However, in the more usual case- in market oriented economies, the market rates are influenced through the discount rate at which the Central Bank lends to the banks and other designated financial intermediaries.

Changes in the discount rate can serve as an instrument of monetary policy in three respects:

1. It affects the amount of borrowing which changes the monetary base and the money supply from the Central Bank.
2. Changes in discount rate (or lack of change of discount rate when one was expected) act as a signal to the private sector of the Central Bank's intentions about monetary policy.
3. The Central Bank's control over its discount rate provides it considerable control over the interest rate in the economy.

The latter two are now the relatively more important reasons for the use of discount rate as an instrument of monetary policy.

The Central Bank- the lender of last resort- In addition to its use as a tool to influence reserves [the monetary base] and the money supply, discounting is important in preventing financial panics. When the Central Bank System was created, its most important role was intended to be as **the lender of last resort**; to prevent bank failures from spinning out of control, it was to provide reserves to banks when no one else would, thereby preventing bank and financial panics. While commercial banks with inadequate reserves can borrow from those with surpluses, a reserve shortage in the financial system as a whole cannot be met in this manner and could force the economy into a liquidity and credit crunch. And therefore, the discount window (the ability to borrow from the Central Bank) is a safety valve for the economy.

Discounting is a particularly effective way to provide reserves to the banking system during a banking crisis because reserves are immediately channeled to the banks that need them most. Using the discount tool to avoid financial panics by performing the role of lender of last resort is an extremely important requirement of successful monetary policymaking.

However, banks are not permitted to make chronic use of the discount window for meeting liquidity needs. Although the Central Bank's role as the lender of last resort has the benefit of preventing bank and financial panics, it does have a cost. If a bank expects that the Central Bank will provide it with discount loans when it gets into trouble, because the borrower bank will be willing to take on more risk knowing that the Central Bank will come to the rescue. The Central Bank's lender-of-last-resort role has thus created a moral hazard problem. In big economies like that of the USA, the moral hazard problem is most severe for large banks, which may believe that the Fed views them as "too big to fail"; that is, they will always receive Fed loans when they are in trouble because their failure would be likely to precipitate a bank panic.

The problem with the discount rate policy is that whenever the Central Bank increases the discount rate, the banks to increase their interest rate on loans, because if borrowing becomes expensive to the banks, then they will make lending to the general public expensive too, and vice versa. Therefore, when the Central Bank considers using the

discount weapon to prevent bank panics, it needs to consider the trade-off between the moral hazard cost of its role as lender of last resort and the benefit of preventing financial panics. This trade-off explains why the Central Bank must be careful not to perform its role as lender of last resort too frequently.

But generally, the following are taken as the most pronounced problems with discount policy.

1. The announcement effect is very large. If the bank increases (decreases) the bank rate, it means a very tight (loose) monetary policy is coming. But the economic agents may react to such policy actions in a very different manner.
2. Discontinuity in the policy: unlike OMOs, this policy is not used on regular basis. Actually, this is the main cause for the huge announcement effects.
3. The initiative is in the hands of the commercial banks. It is how the banks respond to discount rate change which determines the success of this policy tool. In the case of OMOs, the initiative is within the hands of the Central Bank itself.

Thus, there are conditions on which the bank can succeed in using bank rates as instrument of monetary policy:

1. Degree of dependence from the banks: if the degree of dependence of commercial banks on borrowing from the Central Bank is smaller, then the bank rate will be an ineffective monetary policy tool.
2. Sensitivity of banks towards changes in discount rates: - if the banks demand for loans is discount rate inelastic, then this tool will be ineffective monetary tool.
3. The change in discount rate should be visible to the banks to be effective.

5.4.4. Miscellaneous Instruments of Monetary Policy (Qualitative tools)

Dear distance learners! Up until now we have been discussing on the quantitative monetary policy tools. It is time now to raise some other qualitative monetary policy instruments. Yet, you shall remember that all qualitative monetary policy tools are subsidiary towards the quantitative ones. Moral suasion and selective controls are the very common qualitative tools of monetary policy.

1. **Moral Suasion:** - This refers to the use of the influence of the Central Bank upon the commercial banks to follow its suggestions, such as in exercising credit restraint or diverting loans to specified sectors of the economy. Such suggestions do not possess the force of law, although the threat of converting suggestions into legal orders, if necessary, often backs such suggestions. Moral suasion generally works well in countries with a very small number of large banks and with a long tradition of respect for the judgment and the extra-legal authority of the Central Bank.
2. **Selective controls:** - these are those with impact on certain sectors of the economy. A common example of these is credit controls. The common reason for such controls is that social priorities may differ from private priorities. Thus, the government may wish to divert funds to exports, agriculture, and local governance. Some Central Banks favor specific sectors by providing direct credit controls and use some direct regulations and guidelines.



Dear distance learners! Have you seen the difference between moral suasion and selective control qualitative monetary policies?

5.5. Central Bank Strategy: Using and Choosing Targets in Monetary Policy

Dear learner! Given the goals of monetary policy that we discussed above, the Central Bank's problem is that it wishes to achieve certain goals, such as price stability with high employment, but it does not directly influence the goals. Instead, it has a set of tools to employ (open market operations, changes in the discount rate, and changes in reserve requirements) to manipulate the goals indirectly after some period of time. If the Central Bank waits to see what the price level and employment will be one year later, it will be too late to make any corrections to its policy—mistakes will be irreversible. All Central Banks consequently pursue a different strategy for conducting monetary policy by aiming at variables that lie between its tools and the achievement of its goals. The strategy is as follows: After deciding on its goals for employment and the price level, the Central Bank chooses a set of variables to aim for, called intermediate targets, such as the monetary aggregates (M1, M2, or M3) or interest rates (short- or long-term), which have a direct effect on employment and the price level.

However, even these intermediate targets are not directly affected by the Central Bank's policy tools. Therefore, it chooses another set of variables to aim for, called operating targets, or alternatively instrument targets, such as reserve aggregates (reserves, monetary base, or non-borrowed base) or interest rates (Central Federal funds rate or Treasury bill rate), which are more responsive to its policy tools.

The Central Bank pursues this strategy because it is easier to hit a goal by aiming at targets than by aiming at the goal directly. Specifically, by using intermediate and operating targets, it can more quickly judge whether its policies are on the right track, rather than waiting until it sees the final outcome of its policies on employment and the price level. This above reasoning for the use of monetary targets has come under attack, because information on employment and the price level can be useful in evaluating policy.

- ✓ A target is an intermediate variable in the transmission process from policy instruments to the ultimate objectives (bearing a close relationship to both instruments and objectives).
- ✓ The Central Bank pursues the above strategy because it is easier to hit a goal by aiming at targets than by aiming at a goal directly. By using those targets, the bank can more quickly judge whether its policies are on the right track, rather than waiting until it observes the final outcome of its policies on employment, prices, and growth.

Let's synthesize the issue using a numerical illustration.

Illustration: - Suppose that the Central Bank's employment and price level goals are consistent with a growth rate of nominal GDP of 5%. If the bank feels that the 5% growth rate of nominal GDP can be achieved by a 4% growth rate of M_2 (intermediate target), which in turn, may be achieved by a growth rate of the monetary base of $3\frac{1}{2}\%$ (operating target), then it will carry out open market operations (policy tool) to achieve the $3\frac{1}{2}\%$ growth rate of the monetary base. Suppose further that, within days after implementing this policy, the bank finds that the monetary base is growing too slowly, say at 2% rate, then it can correct this slow growth rate by increasing the amount of its open market purchases. Similarly, if the bank finds that M_2 is growing too fast (say at 7%), it decides to reduce its open market purchases or make open market sales. The lesson we derive is that

the bank is using its operating and intermediate targets to direct monetary policy towards the achievement of its goals.

One way of thinking about this strategy is that the Central Bank is using its operating and intermediate targets to direct monetary policy toward the achievement of its goals. After the initial setting of the policy tools, an operating target such as the monetary base, which the Central Bank can control fairly directly, is used to reset the tools so that monetary policy is channeled toward achieving the intermediate target of a certain rate of money supply growth. In the mean while corrections in the policy tools can be made again when the Central Bank sees what is happening to its intermediate target, thus directing monetary policy so that it will achieve its goals of high employment and price stability.

5.5.1. Choice of the Targets

A variable can only serve as an intermediate target (guide) or operating target if it has a close and predictable relationship with the ultimate goal variable of the policy maker. The proper target to a specific goal could in principle be any variable that follows a time path from which the time path of the goal can be forecasted and influenced by the policy tool in a predictable manner. The greater the degree of error in forecasting, the less reliable will be the variable as a guide (target).

The impact of a change in most of the potential operating variables on the ultimate goals is likely to be imprecise, difficult to predict, and/or unstable. This makes the formulation of monetary policy an art rather than a science and caution against attempts to use monetary policy as a precise control mechanism for 'fine- tuning' the goals of such a policy. Another problem with most targets is that they are endogenous and their values depend on both demand and supply factors so that exogenous shocks to them could come from either demand or supply shifts.

Yet you have to expect that the Central Bank still can make a meaningful use of targets so as to attain its ultimate objectives from the manipulation of monetary policy. The following graphical and verbal illustration shows you the case in hand in a very simplified manner.

There are two different types of target variables: interest rates and aggregates (monetary aggregates and reserve aggregates). In our above illustration, the Central Bank chooses a 4% growth rate for M_2 to achieve a 5% rate of growth for nominal GDP. It could have chosen to lower the interest rate on the three-month treasury bills to, say, 3%, to achieve the same goal.

 ***Dear learners! Can the Central Bank choose to pursue both of these targets at concomitantly?***

The answer is no! Why a Central Bank must choose one or the other [among available alternative goals] can be shown using the application of supply and demand analysis of the money market.

Let's first see why a monetary aggregate target involves losing control of the interest rate. Figure 5.3 indicates a supply and demand diagram for the money market. Although the Central Bank expects the demand curve for money to be at M_d^* , it fluctuates between M_d' and M_d'' because of unexpected increases or decreases in output or changes in the price level. The money demand curve might also shift unexpectedly because the public's preference about holding bonds versus money might change.

If the Central Bank's monetary aggregate target of a 4% growth rate in M_2 results in a money supply of M^* , it expects that the interest rate will be i^* . However, as the figure indicates, the fluctuations in the money demand curve between M_d' and M_d'' will result in an interest rate fluctuating between i' and i'' . Pursuing a monetary aggregate target implies that interest rates will fluctuate.

Similarly, the supply and demand diagram in Figure 5.4 show the consequences of an interest-rate target set at i^* . Again, the Central Bank expects the money demand curve to be at M_d^* , but it fluctuates between M_d' and M_d'' due to unexpected changes in output, the price level, or the public's preferences toward holding money.

Figure 5.3: Result of Targeting on the Money Supply, M.

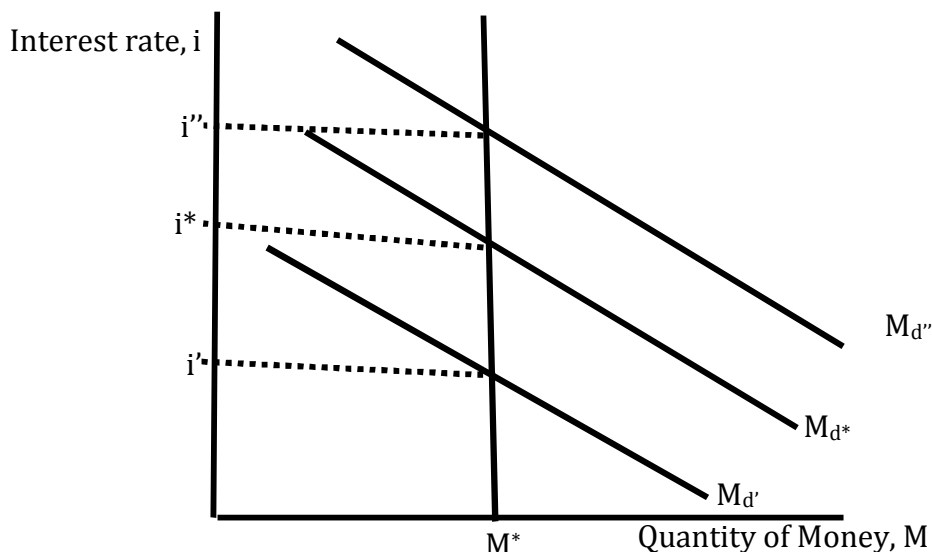
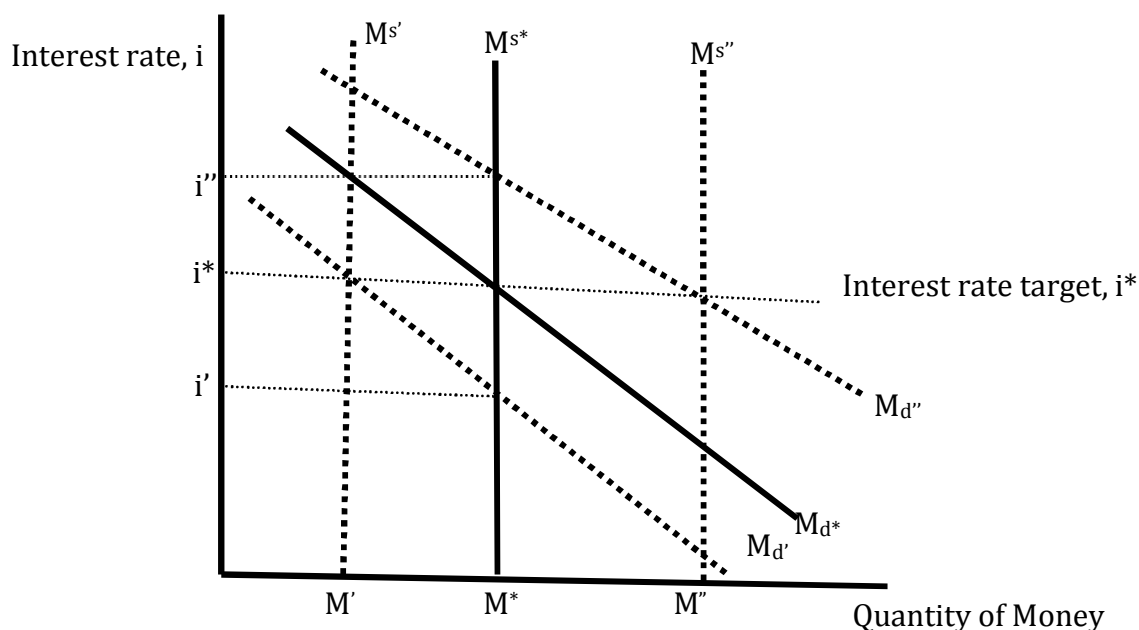


Figure 5.4: Result of Targeting on the Interest Rate, i



Dear distance learners! Despite all these, though alternative targets may be there at a time, the Central Bank does not use all of them together. If the bank decides to manipulate money supply, then it does not try to manipulate interest rate simultaneously and vice versa. The demand for and the supply of money analysis indicates that interest rate and monetary aggregate targets are incompatible to each other. The bank can hit one or the other but not both at a time. Thus, a choice between the targets has to be made. The following section discuss the common criteria used to decide on the target variable.

5.5.1.1. Criteria for Choosing Intermediate Targets

Dear learner! Now it is time to talk about how we can choose intermediate targets. The rationale behind the Central Bank's strategy of using targets suggests three criteria for choosing an intermediate target:

1. **Measurability:** - quick and accurate measurement of an intermediate target variable is necessary because the intermediate target will be useful only if it signals when policy is 'off- the track' more rapidly than a goal.

Data on interest rate are available almost immediately, while those on monetary aggregates can be obtained after a two weeks delay. Data on nominal GDP are compiled only quarterly. Besides, the GDP data are less accurate than the data on interest rates or even on monetary aggregates.

Thus, interest rates seem more measurable than monetary aggregates. Not only are the data on interest rates available more quickly than on monetary aggregates, but they are also measured more precisely and are rarely revised in contrast to the monetary aggregates which are always subject to a fair amount of revision.

However, the interest rate that is quickly and accurately measured, the nominal interest rate, is typically a very poor measure of the real cost of borrowing which more certainly tell us about what will happen to GDP. The real cost of borrowing is more accurately measured by the real interest rate- the rate adjusted for expected inflation ($i_r = i - \pi_e$).

Unfortunately, the real interest rate is extremely hard to measure because there is no direct way of measuring expected inflation rate. Thus, since both interest rate and monetary aggregates have measurability problems, it is not clear which one to prefer as a better guide.

2. **Controllability:** - the bank must be able to exercise effective control over a variable if it is to function as a useful target. If the Central Bank cannot control an intermediate target, knowing that it is off track does little good, because the Central Bank has no way of getting the target back on track. Some economists have suggested that nominal GDP should be used as an intermediate target, but since the Central Bank has little direct

control over nominal GDP, it will not provide much guidance on how the bank should set its policy tools. The Central Bank does, however, have a good deal of control over the monetary aggregates and interest rates.

Our discussion of the money supply process and the Central Bank's policy tools indicates that a Central Bank does have the ability to exercise a powerful effect on the money supply, although its control is not perfect. Similarly, policy tools such as open market operations, can be used to set interest rates by directly affecting the price of bonds. Because a Central Bank can set interest rates directly, whereas it cannot completely control the money supply, it might appear that interest rates dominate the monetary aggregates on the controllability criterion. However, a Central Bank cannot set real interest rates, because it does not have control over expectations of inflation. So there is no clear cut rule to prefer between the two intermediate targets on controllability criterion.

3. *The ability to predictably affect goals:* - the most important characteristic a variable must have to be useful as an intermediate target is that it must have a predictable impact on a goal. Besides, the ability to affect goals is so critical to the usefulness of an intermediate target variable. The linkage of the money supply and interest rates with the goals of monetary policy is a matter of much debate in the economics profession. The detail of this concept will be discussed when you join to transmission mechanisms of monetary policy.

Dear learners! However, evidences indicate that the link between monetary policy goals and money supply is much stronger than the link between these goals and interest rate, thus lending some support to the use of monetary aggregates as intermediate targets.

5.5.1.2. Criteria for Choosing Operating Targets

The choice of an operating target can be made based on the same criteria used to evaluate intermediate targets. Both the Central Federal funds rate and reserve aggregates are measured accurately and are available daily with almost no delay. Both are also easily controllable using policy tools (monetary instruments). As to their predictable effect on goals, we can first think of intermediate targets as goals for the operating targets.

An operating target that has a more predictable impact on the intermediate target, which is considered to be most desirable, is preferred. If the desired intermediate target is an interest rate, then the preferred operating target will be an interest rate variable like the Central Federal funds rate, because interest rates are closely tied to each other. Similarly, if the desired intermediate target is a monetary aggregate, our discussion on money supply indicates that a reserve aggregate operating target such as the monetary base will be preferred. In any case, the choice of which operating target to use best rests on the choice of the intermediate target.

5.6 Transmission Mechanisms of Monetary Policy & Empirical Evidence

5.6.1 Introduction

Since 1980, the U.S. economy has been on a roller coaster, with output, unemployment, and inflation undergoing drastic fluctuations. At the start of the 1980s, inflation was running at double-digit levels, and the recession of 1980 was followed by one of the shortest economic expansions on record. After a year, the economy plunged into the 1981-1982 recession, the most severe economic contraction in the post war era—the unemployment rate climbed to over 10%, and only then did the inflation rate begin to come down to below the 5% level. The 1981-1982 recession was then followed by a long economic expansion that reduced the unemployment rate to below 6% in the 1987-1990 period.

With Iraq's invasion of Kuwait and a rise in oil prices in the second half of 1990, the economy again plunged into recession. Subsequent growth in the economy was sluggish at first but eventually sped up, lowering the unemployment rate to below 5% in the late 1990s. In March 2001, the economy slipped into recession, with the unemployment rate climbing to around 6%. In light of large fluctuations in aggregate output (reflected in the unemployment rate) and inflation, and the economic instability that accompanies them, policymakers face the following dilemma: ***What policy or policies, if any, should be implemented to reduce output and inflation fluctuations in the future?***

To answer this question, monetary policymakers must have an accurate assessment of the timing and effect of their policies on the economy. To make this assessment, they need to understand the mechanisms through which monetary policy affects the economy.

Dear distance learners! In this part, we examine empirical evidence on the effect of monetary policy on economic activity. We first look at a framework for evaluating empirical evidence and then use this framework to understand why there are still deep disagreements on the importance of monetary policy to the economy. We then go on to examine the transmission mechanisms of monetary policy and evaluate the empirical evidence on them to better understand the role that monetary policy plays in the economy. We will see that these monetary transmission mechanisms emphasize the link between the financial system (which we studied in the first three parts of this book) and monetary theory, the subject of this part.

5.6.2 Framework for Evaluating Empirical Evidence

Dear distance learners! To develop a framework for understanding how to evaluate empirical evidence, we need to recognize that there are two basic types of empirical evidence in economics and other scientific disciplines:

- ❖ Structural model evidence and
- ❖ Reduced-form evidences

Structural model evidence examines whether one variable affects another by using data to build a model that explains the channels through which this variable affects the other.

Reduced-form evidence examines whether one variable has an effect on another simply by looking directly at the relationship between the two variables. Dear students, I hope the following illustration will help you to understand the core of each empirical evidence.

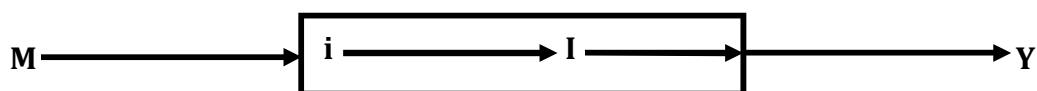
Dear distance learners! Suppose that you were interested in whether drinking coffee leads to heart disease. Structural model evidence would involve developing a model that analyzed data on how coffee is metabolized by the human body, how it affects the operation of the heart, and how its effects on the heart lead to heart attacks. Reduced-form evidence would

involve looking directly at whether coffee drinkers tend to experience heart attacks more frequently than non-coffee drinkers.

How you look at the evidence—whether you focus on structural model evidence or reduced-form evidence—can lead to different conclusions. This is particularly true for the debate between monetarists and Keynesians. Monetarists tend to focus on reduced-form evidence and feel that changes in the money supply are more important to economic activity than Keynesians do; Keynesians, for their part, focus on structural model evidence. To understand the differences in their views about the importance of monetary policy, we need to look at the nature of the two types of evidence and the advantages and disadvantages of each.

❖ Structural model evidence

As stated above Keynesians typically examine the effect of money on economic activity by building a structural model, a description of how the economy operates using a collection of equations that describe the behavior of firms and consumers in many sectors of the economy. These equations then show the channels through which monetary and fiscal policy affect aggregate output and spending. A Keynesian structural model might have behavioral equations that describe the workings of monetary policy with the following schematic diagram:

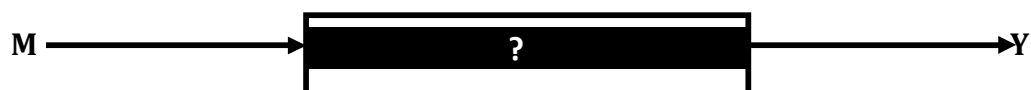


The model describes the transmission mechanism of monetary policy as follows: The money supply **M** affects interest rates **i**, which in turn affect investment spending **I**, which in turn affects aggregate output or aggregate spending **Y**. The Keynesians examine the relationship between **M** and **Y** by looking at empirical evidence (structural model evidence) on the specific channels of monetary influence, such as the link between interest rates and investment spending.

❖ Reduced-form evidence

Monetarists do not describe specific ways in which the money supply affects aggregate spending. Instead, they examine the effect of money on economic activity by looking at whether movements in **Y** are tightly linked to (have a high correlation with) movements in **M**. Using reduced-form evidence, monetarists analyze the effect of **M** on **Y** as if the economy were a

black box whose workings cannot be seen. The monetarist way of looking at the evidence can be represented by the following schematic diagram, in which the economy is drawn as a black box with a question mark:



Now that we have seen how monetarists and Keynesians look at the empirical evidence on the link between money and economic activity, we can consider the advantages and disadvantages of their approaches.

Advantages and disadvantages of structural model evidence

The structural model approach, used primarily by Keynesians, has the advantage of giving us an understanding of how the economy works. If the structure is correct—if it contains all the transmission mechanisms and channels through which monetary and fiscal policy can affect economic activity, the structural model approach has three major advantages over the reduced-form approach.

1. Because we can evaluate each transmission mechanism separately to see whether it is plausible, we will obtain more pieces of evidence on whether money has an important effect on economic activity. If we find important effects of monetary policy on economic activity, for example, we will have more confidence that changes in monetary policy actually cause the changes in economic activity; that is, we will have more confidence on the direction of causation between M and Y.
2. Knowing how changes in monetary policy affect economic activity may help us predict the effect of M on Y more accurately. For example, expansions in the money supply might be found to be less effective when interest rates are low. Then, when interest rates are higher, we would be able to predict that an expansion in the money supply would have a larger impact on Y than would otherwise be the case.
3. By knowing how the economy operates, we may be able to predict how institutional changes in the economy might affect the link between M and Y.

These three advantages of the structural model approach suggest that this approach is better than the reduced-form approach if we know the correct structure of the model. Put another way, structural model evidence is only as good as the structural model it is based on; it is best only if all the transmission mechanisms are fully understood. This is a **big if**, as failing to include one or two relevant transmission mechanisms for monetary policy in the structural model might result in a serious underestimate of the impact of M on Y.

Monetarists worry that many Keynesian structural models may ignore the transmission mechanisms for monetary policy that are most important. For example, if the most important monetary transmission mechanisms involve consumer spending rather than investment spending, the Keynesian structural model (such as the $M \uparrow \Rightarrow i \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$ model we used earlier), which focuses on investment spending for its monetary transmission mechanism, may underestimate the importance of money to economic activity. In other words, monetarists reject the interpretation of evidence from many Keynesian structural models because they believe that the channels of monetary influence are too narrowly defined. In a sense, they accuse Keynesians of wearing blinders that prevent them from recognizing the full importance of monetary policy.

Advantages and disadvantages of Reduced-form evidence

The main advantage of reduced-form evidence over structural model evidence is that no restrictions are imposed on the way monetary policy affects the economy. If we are not sure that what all the monetary transmission mechanisms are, we may be more likely to spot the full effect of M on Y by looking at whether movements in Y correlate highly with movements in M. Monetarists favor reduced-form evidence, because they believe that the particular channels through which changes in the money supply affect Y are diverse and continually changing. They contend that it may be too difficult to identify all the transmission mechanisms of monetary policy.

The most notable objection to reduced-form evidence is that it may misleadingly suggest that changes in M cause changes in Y when that is not the case. A basic principle applicable to all scientific disciplines, including economics, states that correlation does not necessarily

imply causation. The movement of one variable is linked to another doesn't necessarily mean that one variable causes the other.

Suppose, for example, you notice that wherever criminal activity abounds, more police patrols in the street. Should you conclude from this evidence that police patrols cause criminal activity and recommend pulling police off the street to lower the crime rate? The answer is clearly no, because police patrols do not cause criminal activity; criminal activity causes police patrols. This situation is called reverse causation and can produce misleading conclusions when interpreting correlations.

The reverse causation problem may be present when examining the link between money and aggregate output or spending. There may situations in which money supply is affected by change in output. In chapter three of this course, the quantity theory suggests that doubling of nominal output may cause the money supply to double for constant velocity of money.

Another facet of the correlation-causation question is that an outside factor, yet unknown, could be the driving force behind two variables that move together. Coffee drinking might be associated with heart disease not because coffee drinking causes heart attacks but because coffee drinkers tend to be people who are under a lot of stress and the stress causes heart attacks. Getting people to stop drinking coffee, then, would not lower the incidence of heart disease. Similarly, if there is an unknown outside factor that causes M and Y to move together, controlling M will not improve control of Y.

 ***Dear distance learners! Based on the above discussions, which empirical evidence is preferable? Reduced-form evidence or structural model evidence?***

Dear learners! No clear-cut case can be made that reduced-form evidence is preferable to structural model evidence or vice versa. The structural model approach, used primarily by Keynesians, offers an understanding of how the economy works. If the structure is correct, it predicts the effect of monetary policy more accurately, allows predictions of the effect of monetary policy when institutions change, and provides more confidence in the direction of causation between M and Y. If the structure of the model is not correctly specified because it leaves out important transmission mechanisms of monetary policy, it could be very misleading.

The reduced-form approach, used primarily by monetarists, does not restrict the way monetary policy affects the economy and may be more likely to spot the full effect of M on Y . However, reduced-form evidence cannot rule out reverse causation, whereby changes in output cause changes in money, or the possibility that an outside factor drives changes in both output and money. A high correlation of money and output might then be misleading, because controlling the money supply would not help control the level of output.

5.6.3 Transmission mechanisms of monetary policy

Dear learners! Economic research went in two directions. One direction was to use more sophisticated monetarist reduced-form models to test for the importance of money to economic activity.

The second direction was to pursue a structural model approach and to develop a better understanding of channels (other than interest-rate effects on investment) through which monetary policy affects aggregate demand. In this section we examine some of these channels, or transmission mechanisms, beginning with interest-rate channels.

1. The traditional interest rate channel

The traditional Keynesian view of the monetary transmission mechanism can be characterized by the following schematic showing the effect of a monetary expansion

$$M \uparrow \Rightarrow i_r \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \text{-----} 5.1$$

where $M \uparrow$ indicates an expansionary monetary policy leading to a fall in real interest rates ($i_r \downarrow$), which in turn lowers the cost of capital, causing a rise in investment spending ($I \uparrow$), thereby leading to an increase in aggregate demand and a rise in output ($Y \uparrow$).

Although Keynes originally emphasized this channel as operating through businesses' decisions about investment spending, the search for new monetary transmission mechanisms recognized that consumers' decisions about housing and consumer durable expenditure (spending by consumers on durable items such as automobiles and refrigerators) also are investment decisions. Thus, the interest-rate channel of monetary transmission outlined in

Equation 5.1 applies equally to consumer spending, in which 'I' represents residential housing and consumer durable expenditure.

An important feature of the interest-rate transmission mechanism is its emphasis on the real rather than the nominal interest rate as the rate that affects consumer and business decisions. In addition, it is often the real long-term interest rate and not the short-term interest rate that is viewed as having the major impact on spending.

The fact that it is the real interest rate rather than the nominal rate that affects spending provides an important mechanism for how monetary policy can stimulate the economy, even if nominal interest rates hit a floor of zero during a deflationary episode. With nominal interest rates at a floor of zero, an expansion in the money supply ($M \uparrow$) can raise the expected price level ($P^e \uparrow$) and hence expected inflation ($\pi^e \uparrow$), thereby lowering the real interest rate ($i_r = i - \pi^e$) even when the nominal interest rate is fixed at zero and stimulating spending through the interest-rate channel:

$$M \uparrow \Rightarrow P^e \uparrow \Rightarrow \pi^e \uparrow \Rightarrow i_r \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \text{-----} 5.2$$

This mechanism thus indicates that monetary policy can still be effective even when nominal interest rates have already been driven down to zero by the monetary authorities.

2. Other assets price channel

A. Exchange rate channel

With the growing internationalization of economies throughout the world and the advent of flexible exchange rates, more attention has been paid to how monetary policy affects exchange rates, which in turn affect net exports and aggregate output.

This channel also involves interest-rate effects, because when domestic real interest rates fall, domestic birr deposits become less attractive relative to deposits denominated in foreign currencies. As a result, the value of birr deposits relative to other currency deposits falls, and the birr depreciates (denoted by $E \downarrow$). The lower value of the domestic currency makes domestic goods cheaper than foreign goods, thereby causing a rise in net exports ($NX \uparrow$) and hence aggregate output ($Y \uparrow$). The schematic for the monetary transmission mechanism that operates through the exchange rate is:

$$M\uparrow \Rightarrow i_r\downarrow \Rightarrow E\downarrow \Rightarrow NX\uparrow \Rightarrow Y\uparrow \text{-----} 5.3$$

B. Tobin q channel

James Tobin developed a theory, referred to as Tobin's '**q**' theory that explains how monetary policy can affect the economy through its effects on the valuation of equities (stock). Tobin defines **q** as the market value of firms divided by the replacement cost of capital. If **q** is high, the market price of firms is high relative to the replacement cost of capital, and new plant and equipment capital is cheap relative to the market value of firms. Companies can then issue stock and get a high price for it relative to the cost of the facilities and equipment they are buying. Investment spending will rise, because firms can buy a lot of new investment goods with only a small issue of stock. Conversely, when **q** is low, firms will not purchase new investment goods because the market value of firms is low relative to the cost of capital. If companies want to acquire capital when **q** is low, they can buy another firm cheaply and acquire old capital instead. Investment spending, the purchase of new investment goods, will then be very low.

The crux of this discussion is that a link exists between Tobin's **q** and investment spending. But how might monetary policy affect stock prices? Quite simply, when monetary policy is expansionary, the public finds that it has more money than it wants and so gets rid of it through spending. One place the public spends is in the stock market, increasing the demand for stocks and consequently raising their prices. Combining this with the fact that higher stock prices (P_s) will lead to a higher **q** and thus higher investment spending **I** leads to the following transmission mechanism of monetary policy:

$$M\uparrow \Rightarrow P_s\uparrow \Rightarrow q\uparrow \Rightarrow I\uparrow \Rightarrow Y\uparrow \text{-----} 5.4$$

C. Wealth effect

In their search for new monetary transmission mechanisms, researchers also looked at how consumers' balance sheets might affect their spending decisions. Franco Modigliani was the first to take this track, using his famous life cycle hypothesis of consumption. Consumption is spending by consumers on nondurable goods and services. It differs from consumer expenditure in that it does not include spending on consumer durables. The basic premise of

Modigliani's theory is that consumers smooth out their consumption over time. Therefore, what determines consumption spending is the lifetime resources of consumers, not just today's income.

An important component of consumers' lifetime resources is their financial wealth, a major component of which is common stocks. When stock prices rise, the value of financial wealth increases, thereby increasing the lifetime resources of consumers, and consumption should rise. Considering that, as we have seen, expansionary monetary policy can lead to a rise in stock prices, we now have another monetary transmission mechanism:

$$M \uparrow \Rightarrow P_s \uparrow \Rightarrow \text{wealth} \uparrow \Rightarrow \text{consumption} \uparrow \Rightarrow Y \uparrow \text{-----} 5.5$$

3. Credit Channels

Dissatisfaction with the conventional stories that interest-rate effects explain the impact of monetary policy on expenditures on durable assets has led to a new explanation based on the problem of asymmetric information in financial markets. This explanation, referred to as the *credit channel*, proposes that two types of monetary transmission channels arise as a result of information problems in credit markets: those that operate through effects on bank lending and those that operate through effects on firms' and households' balance sheets.

A. Bank lending channel

The bank lending channel is based on the analysis in Chapter two, which demonstrated that banks play a special role in the financial system because they are especially well suited to solve asymmetric information problems in credit markets. Because of banks' special role, certain borrowers will not have access to the credit markets unless they borrow from banks. As long as there is no perfect substitutability of retail bank deposits with other sources of funds, the bank lending channel of monetary transmission operates as follows. Expansionary monetary policy, which increases bank reserves and bank deposits, increases the quantity of bank loans available. Because many borrowers are dependent on bank loans to finance their activities, this increase in loans will cause investment (and possibly consumer) spending to rise. Schematically, the monetary policy effect is:

$$M \uparrow \Rightarrow \text{bank deposits} \uparrow \Rightarrow \text{bank loans} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \text{-----} 5.6$$

B. Balance sheet channel

Like the bank lending channel, the balance sheet channel also arises from the presence of asymmetric information problems in credit markets. It has the following dimensions:

i) Firms' net worth channel:

The lower the net worth of business firms, the more severe the adverse selection and moral hazard problems in lending to these firms. Lower net worth means that lenders in effect have less collateral for their loans, and so potential losses from adverse selection are higher. A decline in net worth, which raises the adverse selection problem, thus leads to decreased lending to finance investment spending. The lower net worth of businesses also increases the moral hazard problem because it means that owners have a lower equity stake in their firms, giving them more incentive to engage in risky investment projects. Since taking on riskier investment projects makes it more likely that lenders will not be paid back, a decrease in businesses' net worth leads to a decrease in lending and hence in investment spending.

Monetary policy can affect firms' balance sheets in several ways. Expansionary monetary policy ($M \uparrow$), which causes a rise in stock prices ($P_s \uparrow$) along lines described earlier, raises the net worth of firms and so leads to higher investment spending ($I \uparrow$) and aggregate demand ($Y \uparrow$) because of the decrease in adverse selection and moral hazard problems. This leads to the following schematic for one balance sheet channel of monetary transmission:

$$M \uparrow \Rightarrow P_s \uparrow \Rightarrow \text{adverse selection} \downarrow, \text{moral hazard} \downarrow \Rightarrow \text{lending} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \text{-----} 5.7$$

ii) Cash flow channel

Another balance sheet channel operates through its effects on cash flow, the difference between cash receipts and cash expenditures. Expansionary monetary policy, which lowers nominal interest rates, also causes an improvement in firms' balance sheets because it raises cash flow. The rise in cash flow causes an improvement in the balance sheet because it increases the liquidity of the firm (or household) and thus makes it easier for lenders to know whether the firm (or household) will be able to pay its bills. The result is that adverse selection and moral hazard problems become less severe, leading to an increase in lending and economic activity. The following schematic describes this additional balance sheet channel:

$M \uparrow \Rightarrow i \downarrow \Rightarrow \text{cash flow} \uparrow \Rightarrow \text{adverse selection} \downarrow, \text{moral hazard} \downarrow \Rightarrow \text{lending} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$ 5.8

An important feature of this transmission mechanism is that it is nominal interest rates that affect firms' cash flow. Thus, this interest-rate mechanism differs from the traditional interest rate mechanism discussed earlier, in which it is the real rather than the nominal interest rate that affects investment. Furthermore, the short-term interest rate plays a special role in this transmission mechanism, because it is interest payments on short-term rather than long-term debt that typically have the greatest impact on households' and firms' cash flow.

Dear distance learners! Why Are Credit Channels Likely to Be Important?

There are three reasons to believe that credit channels are important monetary transmission mechanisms. **First**, a large body of evidence on the behavior of individual firms supports the view that credit market imperfections of the type crucial to the operation of credit channels do affect firms' employment and spending decisions. **Second**, there is evidence that small firms (which are more likely to be credit-constrained) are hurt more by tight monetary policy than large firms, which are unlikely to be credit-constrained. **Third**, and maybe most compelling, the asymmetric information view of credit market imperfections at the core of the credit channel analysis is a theoretical construct that has proved useful in explaining many other important phenomena, such as why many of our financial institutions exist, why our financial system has the structure that it has, and why financial crises are so damaging to the economy.

Dear distance learners! The following points can be taken as a lesson from our discussion of monetary policy transmission mechanisms:

- a) It is dangerous always to associate monetary policy easing or tightening with a fall or a rise in short term nominal interest rates;
- b) other asset prices besides those on short-term debt instruments contain important information about the stance of monetary policy because they are important elements in the monetary policy transmission mechanisms; and

- c) Monetary policy can be highly effective in reviving a weak economy even if short-term interest rates are already near zero.

Chapter Five: Review Questions

Part I: Choose a single best answer for the following questions

- 1) Budget deficit of the government leads to the adoption of inflationary monetary policy if
 - A) The deficit is financed by continuous rising of tax
 - B) The deficit is financed by issuing bonds
 - C) The deficit is financed by issuing money
 - D) The deficit is evaporated by cutting government expenditure
 - E) All of the above
- 2) Phillips curve perfectly substantiated one of the following conflicting objective
 - A) Full employment and economic growth
 - B) Interest rate and financial market stability
 - C) Interest rate stability and price stability
 - D) Price stability and economic growth
 - E) Price stability and full employment
- 3) Socialist countries may **NOT** be effective using open market operation (OMO) as a monetary policy tool because they commonly failed to satisfy one of the following pre-conditions of OMO
 - A) The financial structure of the economy should be well developed
 - B) There should be a relatively large amount of government securities
 - C) The market established priorities must broadly coincide with the politically acceptable priorities
 - D) The financial markets of the country should be broadly independent of those of other countries.
 - E) All of the above

- 4) One has the objective of building public's confidence on the reliability of commercial banks
- A) Open market operation C) Operational targets
B) Discount rates D) **Required reserve rate** E) None of the above
- 5) Which one of the following is **FALSE** as far as discount rate policy is concerned?
- A) Discount rate is higher than the federal funds rate target
B) The amount of discount lending under the primary credit facility is very small
C) The interest rate on secondary credit is above the primary discount rate.
D) The interest rate charged on seasonal credit is tied to the average of the federal funds rate and certificate of deposit rates.
E) **None of the above**
- 6) Recently the National Bank of Ethiopia (NBE) devaluated the domestic currency Birr, what kind of policy the NBE should simultaneously implement to mitigate the inflation problem that may arise from the devaluation.
- A) Printing more money
B) Decreasing required reserve ratio
C) **Increasing the interest rate**
D) Providing more amount discount window facility
E) All except 'A'
- 7) Which one of the following is **WRONG** about monetary policy targets
- A) Monetary aggregates is one among the different intermediate targets
B) Intermediate targets are not directly controlled by the Central Bank's policy tools
C) It is easier to hit a goal by aiming at targets than by aiming at the goal directly
D) Pursuing a monetary aggregate target leads for the fluctuation of interest rates target.
E) **The central bank can manipulate money supply and interest rate simultaneously.**
- 8) The monetarist's reduced-form evidence **CANNOT** be explained by
- A) Existence of reverse causation and leads us for misleading conclusions
B) No restrictions are imposed on the way monetary policy affects the economy

- C) In this empirical evidence correlation does not necessarily imply causation.
- D) There may be unknown out-side factor that causes the two variables move together
- E) None of the above
- 9) Under the exchange rate channel of monetary policy transmission, What will happen in the Ethiopian economy if the National bank of Ethiopia apply contractionary monetary policy (decreasing money supply)
- A) Domestic birr deposits become more attractive relative to deposits denominated in foreign currencies
- B) The value of birr deposits relative to other currency deposits rises,
- C) It causes a fall in net exports
- D) Domestic real interest rates rise
- E) All of the above
- 10) _____explains how monetary policy can affect the economy through its effects on the valuation of equities (stocks).
- A) Wealth effect channel C) Bank lending channel
- B) Tobin q-channel D) Balance sheet channel E) Interest rate channel

Part II: Give a short and precise answer for the following questions

- 11) Monetary policy makers have two types of intermediate targets (interest rate and monetary aggregate) to meet the government goals. But it is impossible to employ both targets simultaneously to meet a given goal say 10% economic growth. Rather, the use of one target leads to the rejection of the other. Describe verbally and graphically why the use of interest rate target leads to the rejection of monetary aggregate as an intermediate target.
- 12) Critically examine the relative roles of 'open market operations', 'variations in reserve requirements', and 'bank rates' monetary policy instruments in a given economy. In this context, explain the relative advantages of quantitative monetary policy instruments over the qualitative monetary policy instruments.

Chapter Six

Monetary Policy in Ethiopia

Dear distance learners! It is self-evident that monetary policy plays an important role in the performance of an economy. However, the effectiveness of the policy in achieving the intended goal largely depends on the institutional factors that constrain or facilitate the implementation process of the policy.

Dear learners! Until this chapter we have seen lot of things about the general monetary policy, however in this chapter we will discuss the conduct of monetary policy in Ethiopia. As we know the sole responsibility of conducting monetary policy is given to the National Bank of Ethiopia (NBE). More specifically, you are expected to understand and be able to explain the following issues:

- ✓ The powers & duties of National Bank of Ethiopia
- ✓ The monetary policy objectives of the NBE
- ✓ The monetary policy strategy/Targeting framework of the NBE
- ✓ The monetary policy instruments used by the NBE
- ✓ The Exchange rate regime of Ethiopia

6.1. Introduction: Powers & Duties of NBE

The National Bank of Ethiopia (NBE) is the central bank of Ethiopia. The National Bank of Ethiopia was established in 1963 by proclamation 206 of 1963 and began operation in January 1964. Prior to this proclamation, the Bank used to carry out dual activities, i.e. commercial banking and central banking. Following the proclamation, the National Bank of Ethiopia was entrusted with the following powers and duties:

- ☞ Issue paper money and coins.
- ☞ Regulate the supply, availability and cost of money and credit.
- ☞ Formulating, implements and follows-up the country's exchange rate policy, and manages and administers the international reserves of the country.
- ☞ Fix and control the foreign exchange rates.

- ☞ Licenses, supervises, encourages and regulates the operations of banks, insurance companies and other financial institutions.
- ☞ Provides short- and long-term refinancing facilities to banks and other financial institutions.
- ☞ Supervise loans of commercial banks and regulate interest rates.
- ☞ Acts as banker, fiscal agent and financial advisor to the Government.
- ☞ Sets limits on gold and foreign exchange assets, which banks, and other financial institutions authorized to deal in foreign exchange can hold in deposits.
- ☞ Sets limits on the net foreign exchange positions and terms, and the amount of external indebtedness of banks and other financial institutions.
- ☞ Accepts deposit of any kind from foreign sources.
- ☞ Prepares periodic economic studies, together with forecasts of the balance of payments, money supply, prices and other relevant statistical indicators of the Ethiopian economy useful for analysis and for the formulation and determination by the Bank of monetary, saving and exchange policies.
- ☞ Represents the country in international monetary institutions and acts consistently with international monetary and banking agreements to which Ethiopia is a party.
- ☞ Exercises and performs such other powers and activities as central banks customarily perform.

6.2. Monetary Policy Objective of the National Bank of Ethiopia

Dear learners! The principal objective of the monetary policy of the National Bank of Ethiopia is to maintain price & exchange rate stability and support sustainable economic growth of Ethiopia. Price stability is a proxy for macroeconomic stability which is vital in private sector economic decision on investment, consumption, international trade and saving. Finally, macroeconomic stability fosters employment and economic growth. Maintaining exchange rate stability on the other hand is considered as the principal policy objective of NBE so as to be competitive in the

international trade and to use exchange rate intervention as policy tools for monetary policy to affect both foreign reserve position and domestic money supply.

More specifically, the objectives of Ethiopia's monetary policy are to:

- ☞ Foster monetary, credit and financial conditions conducive to orderly, balanced and sustained economic growth and development.
- ☞ Preserve the purchasing power of the national currency – ensuring that the level of money supply is generally consistent with developments in the macro-economy and intervening in the foreign exchange rate market for the purpose of stabilizing the rate when conditions necessitate.
- ☞ Encourage the mobilization of domestic and foreign savings and their efficient allocation for productive economic activities through the implementation of a prudent market driven interest rate policy.
- ☞ Facilitate the emergence of financial and capital markets that are capable of responding to the needs of the economy through appropriate policy measures. These measures would ensure the gradual introduction of trading instruments on a short-term basis.

6.3. Monetary Policy Strategy/Targeting Framework of NBE

Dear learners! Monetary policy strategy of National Bank Ethiopia depends on a number of factors that are unique and contextual to the country. Given the policy objective, any good strategy depends on the macroeconomic and the institutional structure of the economy. An important factor in this context is the degree of openness of the economy. The more open the economy is, the more the external sector plays a dominant role in monetary management.

Within a country's monetary management framework, there are basically three targets: the ultimate or final target, the intermediate target and the operating target.

6.3.1. Final and Intermediate targets

The final targets of monetary policy in Ethiopia are to maintain price and exchange rate stability and support sustainable economic growth. In achieving these objectives, the

NBE sets money supply as an intermediate target. It should be noted that intermediate targets are not directly controlled by the central bank.

Traditionally, money supply is defined from its narrow and broader sense. Narrow money (M1) is a measure of money stock intended primarily for use in transactions. It consists of currency held by the public, traveller's checks, demand deposits and other checkable deposits. Broad Money (M2) is a measure of the domestic money supply that includes M1 plus Quasi-money (savings and time deposits), overnight repurchase agreements, and personal balances in money market accounts. Basically, M2 includes money that can be used for spending (M1) plus items that can be quickly converted to M1. NBE takes the broader definition of money or M2 as money supply. The current target is to ensure that the money supply growth is in line with nominal GDP growth rate.

6.3.2. Operational target

The operational target is an economic variable that the central bank wants to influence, largely on a day-to-day basis, through its monetary policy instruments. They can be used to link instruments of monetary policy to intermediate targets set by the central bank and represent the first impulse in the transmission process of monetary policy. The growth of base money/reserve money is being used as operational target of the National Bank of Ethiopia. Reserve money (Base money) is defined as the sum of currency in circulation and deposits of commercial banks at NBE. The practice of targeting reserve money is based on the assumption that there will be a stable money demand function in the economy. If the money demand happens to be unstable over the medium to long term, then the NBE will shift its targeting in to another workable framework such as interest rate targeting or multiple indicator approach¹.

¹ Reserve Bank of India uses multiple indicator approach to monetary policy that provides a broad indicator of the stance of liquidity conditions. It uses indicators such as interest rate, exchange rates, fiscal and external positions and flow of financial resources for purpose of monetary management. Multiple indicator approach has the advantages of basing monetary policy operations on a large set of information and providing flexibility in the conduct of monetary management.

In addition, the Bank shall maintain the international reserves at a level which, in its opinion, is adequate for Ethiopia's international transactions. In this regard, a minimum threshold at which foreign reserves are considered adequate is set at three months of imports of goods and services.

6.4. Monetary Policy Instruments of NBE

The introduction of a wide range of monetary instruments by central banks engenders competition, efficiency and transparency and broadens financial intermediation in the banking system. It also promotes liquidity management of commercial banks and gradually leads to the development of well-functioning money and financial markets which could serve as catalysts for economic growth and development.

So far, the use of such instruments has been extremely limited in Ethiopia due to the underdevelopment of the money market and the virtual non-existence of a financial market. Thus, it is envisaged to use a mix of diversified monetary policy instruments so as to effectively carry out the monetary management function of the NBE.

Open Market Operation (Sale & purchase of bonds or securities issued by governments) has generally been used by countries as one of the main instruments for the development of money markets. Trading in these instruments liquefies the financial system in particular and the national economy in general and increases financial intermediation among market participants. In light of this, the NBE will use open market operations (sale and purchase of government securities) as one of its monetary policy instruments. In the absence of its own securities, certain amount of government treasury bills needs to be allocated to NBE by the government for its monetary policy purpose. To prepare the ground for enhanced open market operations, the yield on government securities should be at least close to the minimum interest rate. As a next step, secondary market for government securities needs to be established.

A standing central bank credit facility is another instrument used to enhance the financial capacity of commercial banks and to promote financial intermediation and

efficiency. The key advantages of such standing credit facility are transparency and predictability of accessing central banks' resources to cover short-term needs. This credit facility gives banks an assurance that, when confronted with problems of shortfall in the clearing and a lack of alternatives for raising immediate funds in the inter-bank market, they can settle the clearing with the central bank's funds at a reasonable interest rate which has a clear relationship with short term market interest rates. The NBE will use this facility as one of its monetary policy instruments.

Other monetary policy instruments used and to be used include:

- ✓ Reserve requirement
- ✓ Setting of floor deposit interest rate (until interest rate is fully deregulated)
- ✓ Direct borrowing/lending in the inter-bank money market and introducing re-purchase agreement (repo/reverse repo operations),
- ✓ Use of selected credit control when necessary, and
- ✓ Moral Suasion

6.5. Exchange Rate Regime in Ethiopia

Dear learners! The exchange rate regime is the way a country manages its currency in respect to foreign currencies and the foreign exchange market. It is closely related to monetary policy and the two are generally dependent on many of the same factors.

There are various types of exchange rate regimes being practiced by countries. The main types include *floating, pegged (managed) floating and fixed*.

 **Floating Exchange Rate:** They are the most common exchange rate regimes today. For example, the dollar, euro, yen, and British pound all float. However, since central banks frequently intervene to avoid excessive appreciation/depreciation, these regimes are often called managed float or a dirty float.

 **Pegged (Managed) Floating Exchange Rate:** Here, the currency is pegged to some band or value, either fixed or periodically adjusted. Pegged floats are:

- *Crawling bands*: the rate is allowed to fluctuate in a band around a central value, which is adjusted periodically. This is done at a preannounced rate or in a controlled way following economic indicators.
- *Crawling pegs*: Here, the rate itself is fixed, and adjusted as above. Pegged with horizontal bands: The currency is allowed to fluctuate in a fixed band (bigger than 1%) around a central rate.

 **Fixed Exchange Rate**: Fixed rates are those that have direct convertibility towards another currency. In case of a separate currency, also known as a currency board arrangement, the domestic currency is backed one to one by foreign reserves. A pegged currency with very small bands (< 1%) and countries that have adopted another country's currency and abandoned its own also fall under this category.

The choice of exchange rate regime is determined by various factors, such as the objectives pursued by the policy makers, the sources of shocks hitting the economy and the structural characteristics of the economy. But once the choice is made, the authorities are presumed to adjust their macroeconomic policies (especially fiscal and monetary policies) to fit the chosen exchange rate policy.

Dear learners! Considering the underlying economic situation of the country, *managed floating exchange rate regime* is being practiced in Ethiopia since 1992. This exchange rate regime will continue to be adopted in the years to come.

Chapter Six: Review Questions

Part I: Give a short and precise answer for the following questions

- 1) If MoFED has just paid for computer suppliers and as a result its deposits with the NBE fall, what defensive open market operations will the manager of the open market desk undertake?
- 2) The government of Ethiopia currently provides a lease machine credit service to graduated micro and small enterprises through development bank of Ethiopia as a youth fund with least collateral amount of 20% of total machine. It will also refund

the collateral to the borrowers as working capital after their business set up in order to encouraging the manufacturing sector of the country and other economic benefits are expected from this policy strategies.

- A) What type of monetary policy tools is it?
- B) Do you expect any asymmetric information problem from this loan service?
- C) What will happen to money supply in a domestic economy?

Module References:

Frederic S. Mishkin (2004), The Economics of Money, Banking and Financial Markets, 7th edition (Text book)

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Coates, W. R. and D.R. Khatekhate, (eds) (1980), Money and Monetary policy in less Developed countries, Pergamon Press.

Ghatak, S, (1981) Monetary Economics in Less Developed Countries, MacMillan.

Hosek, W and F. Zahn (1977), Monetary Theory, Policy and Financial Markets, McGraw Hill

Miller and Van Hoose (1993), Modern Money and Banking

MEDaC, (2014), Annual Report of the Ethiopia, Annual Report of the Ethiopian Economy.

National Bank of Ethiopia, Annual Report and Quarterly Bulletins, Various Issues



ARBA MINCH UNIVERSITY

DISTANCE EDUCATION

ASSIGNMENT FOR MONETARY ECONOMICS (ECON -3121)

NAME: _____

ID.No: _____

DEPARTMENT: _____

CENTER: _____

DATE OF SUBMISSION: _____

INSTRUCTIONS

- ✓ *This assignment is to be completed and send to AtfU, College of Continuing & Distance Education for Evaluation. Its maximum weight is 30%*
- ✓ *Make sure that your exam contains ten (10) questions*
- ✓ *Do not try to complete the assignment until you have covered all the lessons and reviewed the study guide and your exercises and activities.*
- ✓ *Duplication from other will result total cancellation of your marks*
- ✓ *After successfully completing this assignment, be certain to write your name, ID.No and program on the cover page of your assignment.*

❖ Give the appropriate answer for the following questions

- 1) Recently, Ethiopia has devaluated its currency by 15%. What are the potential short and long run benefits and costs of to the economy?
- 2) Some economists suspect that one of the reasons that economies in developing countries grow so slowly is that they do not have well-developed financial markets. Does this argument make sense? If yes, trace the relationship between economic growth and financial markets/intermediaries.
- 3) Why have some economists described money during a hyperinflation as a “hot potato” that is quickly passing from one person to another?
- 4) There is decreasing trend worldwide as far as using required reserve rate as tool of monetary policy is concerned. What are the reasons for the declining in using requires reserve rate as a monetary policy tool?
- 5) In addition to meeting the long run electric power demand of the country, some economists attach a macroeconomic stability (reduction of inflation) role by the Great Renaissance Dam since the finance source is domestic. Do you think that this role of the Dam will be entertained if
 - A) The majority of the fund collected is used to pay for the workers? Why?
 - B) The majority of the fund collected is used to purchase capital goods from abroad? Why?
- 6) If the bank you manage after graduation has no excess reserves and a sound customer comes in asking for a loan, should you automatically turn the customer down, explaining that you don’t have any excess reserves to lend out? Why or why not? What options are available for you to provide the funds your customer needs?
- 7) If the national bank lends five banks a total of \$100 million but depositors withdraw \$50 million and hold it as currency, what happens to reserves and the monetary base? Use T-accounts to explain your answer. What you conclude from your answer?
- 8) Is inflation the phenomenon of capitalism? If your answer is yes/no, support your stand with empirical evidence.

9) When the economy enters a recession, an interest rate target will lead to a slower rate of growth for the money supply. Explain why this statement is true. What does it say about the use of interest rates as targets?

10) The hypothetical country's currency, reserve and deposit values are given in the following way

C=100 billion birrs

D=1000 billion birrs

RR=100 billion birrs

ER= 1billion birr, calculate

A. The value of money multiplier

B. Interpret the result you get in part 'A'

C. How much of monetary base we need to support the existing money supply (M_1)?