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### DETERMINANTS OF MONEY DEMAND IN ETHIOPIA

#### ECONOMY AFTER 1994.

Project Work submitted to the Indira Gandhi National Open University in partial fulfillment of the requirements for the award of the Degree – Master of Arts (Economics). I hereby declare that this Work has been done by me and has not been submitted elsewhere.

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## **Abstract**

This research aims to investigate the main factor that determine the broad money demand in Ethiopia economy after 1994 NBE (National Bank of Ethiopia) reformation .specifically test of the degree of determination of each dependent and independent variables . For the sake of achieving the objectives of this study The equation of regression generally built around two sets of variables, namely depend variable (broad money demand ) and independent variables ( gross domestic product , inflation rate , exchange rate and interest rate).

The main source of data is the quarterly and annual reports of the National Bank of Ethiopia (NBE), MOFED (Minister of Finance and Economics Development) and CSA (Central Statics Authority) which covers the last 20 years from 1994/95 to 2013/2014.

The data were analyzed using descriptive and econometric analysis method. The econometric analysis includes empirical and graphical analyses.

The major significance of the study, understanding of the major determinants of the money demand and achieving stable money demand function plays a significant role in monetary policy implementation.

## ACRONYM

BOM	Balance of payment
CSA	Central statics authority
FDI	foreign direct investment
LDC	least developed countries
GDP	Goss domestic product
MOFED	Minister of finance and economic development
NBE	National bank of Ethiopia
ODA	official development assistance
Amole	Salt /that use as primitive money
Birr	The current name Ethiopian currency
(Iquib)	Name of Informal sector of money mobilization in Ethiopia
(idir)	Name of Informal sector of money mobilization in Ethiopia
(mahiber)	Name of Informal sector of money mobilization in Ethiopia
Talers	The name of the first Ethiopian currency

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# Chapter One

## 1.1 Introduction

One of the most remarkable features of the economic history of Ethiopia is the use of 'primitive money', such as bars of salt, pieces of cloth and bars of iron for many hundred years prior to the Italian invasion of 1935. Though this phenomenon of primitive money is of course well known in most parts of Africa, as well as in other continents, it is of particular interest in Ethiopia for the country's relatively rich historical records afford us the opportunity to examine the matter in some detail

Traditionally, the Ethiopian economy was largely based on subsistence agriculture, trade being therefore at a minimum. A large proportion of such transactions as occurred moreover took the form of barter. A certain amount of Hungarian, Venetian and Arab currency was nonetheless used in the sixteenth century, while Maria Theresa dollars, which first appeared in the country in the early nineteenth century, soon acquired a considerable circulation. A national currency did not come into existence until 1894 when it was established by the reforming Emperor Menelik.

The prevalence of barter and the not inconsiderable use of such coins, 'primitive money' enjoyed a remarkable position in Ethiopian trade. Though the items used as money were very different in substance, they had two common characteristics:

- 1) They were in widespread demand for purposes of consumption being articles of food, clothing, decoration or else simple items used in agriculture or war ;
- 2) They were in most cases not easily obtainable, scarcity resulting from the fact that they had often to be taken by primitive modes of transport over considerable distances from afar off source of origin either in the country or abroad.

The principal article of exchange in Ethiopia, as in many other parts of Africa, was salt which was used in trade for probably at least a millennium and a half, being first referred to by the Egyptian monk Cosmas Indicopleustes who learnt of its use as early as about 525

A.D. Alvarez, a priest who accompanied the first Portuguese diplomatic mission to Ethiopia almost exactly a thousand years later, in 1520, says that the mineral was used as money throughout the Kingdoms that the Empire of Ethiopia, and was so widely accepted that whoever carries it finds all that he requires. (Richard Pankhurst, 1962)

The circulation of the salt bar, or amole, used in exchange, was governed by the basic logic of supply and demand. The commodity, which was needed for cooking purposes in every household, was mined in the northern Dankali plain and was transported over large areas of the country which relied on it entirely having no other source of supply ; though primarily perhaps an article of consumption the amole served extensively as ' primitive money ' being exchanged many times before being finally consumed.

Ethiopia holds the Ethiopian birr as its official currency. A full history of the currency dates back to the year 1894. During the aforementioned year, the first currency of Ethiopia was called Menelik Talers. When the country was held captive by Italian forces, the currency was forcefully changed into the Italian lire until expulsion of these captors was achieved in the year 1942. In the year 1945, the Ethiopian birr was finally introduced. First, it was called the Ethiopian dollar; it was renamed birr in the late 1979.

In Ethiopia, paper money is a recent phenomenon. That means the people were used to use the bartering system or they use precious metals to undertake their transaction and also to store their wealth. The very reason for demand for money in Ethiopia is to make transactions easier than it was before

After the ending of the barter system in the primitive society, the people start to use money in Ethiopia and government print a legal tender and use it for facilitating transaction and repayment of debt with its various function. Its recent introduction to Ethiopia and the absence of strong financial market contributed a lot for the ineffectiveness of the monetary policy.

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. The proclamation raised the

Bank's capital to Ethiopian dollars 10.0 million and granted broad administrative autonomy and juridical personality. Following the proclamation, the National Bank of Ethiopia was entrusted with the following responsibilities. (website, [www national bank of Ethiopia](http://www.nationalbankofethiopia.gov.et))

- To regulate the supply, availability and cost of money and credit.
- To manage and administer the country's international reserves.
- To license and supervise banks and hold commercial banks reserves and lend money to them.
- To supervise loans of commercial banks and regulate interest rates.
- To issue paper money and coins.
- To act as an agent of the Government.
- To fix and control the foreign exchange rates.

The Bank was allowed to participate actively in national planning, specifically financial planning, in cooperation with the concerned state organs. The Bank's supervisory area was also increased to include other financial institutions such as insurance institutions, credit cooperatives and investment-oriented banks. Moreover the proclamation introduced the new Ethiopian currency called 'birr' in place of the former Ethiopia Dollar that eased to be legal tender thereafter.

The proclamation revised the Bank's relationship with Government. It initially raised the legal limits of outstanding government domestic borrowing to 25% of the actual ordinary revenue of the government during the preceding three budget years as against the proclamation 206/1963, which set it to be 15%. (Website, [www national bank of Ethiopia](http://www.nationalbankofethiopia.gov.et)). So the people were not interested to demand more because of the prescribed limitations. The motives are not only for transaction purpose as before but also for store of wealth even though there were some restrictions. So the role of monetary policy was very limited since the price and exchange rates were under direct control of the government.

The new proclamation issued in 1994 reorganize the Bank according to the market-based economic policy so that it could foster monetary stability, a sound financial system and

such other credit and exchange conditions as are conducive to the balanced growth of the economy of the country.

Moreover, the proclamation has also raised the paid-up capital of the Bank from Birr 30.0 million to Birr 50.0 million. After the 1994 reform certain new extent appeared and the financial sector shows a little improvement as compared to the past. Individuals demand for money more than the above two motives and in addition for emergency purpose with no limitation and one of the policy instruments which interest rate was partially liberalized from past direct control.

## **1.2 Statement of the problem**

Without proper determination of money demand determinants, effectiveness of monetary policy seems like a night mare. Monetary policy instrument employed to achieve rapid economic growth and stabilization in least developed countries (including Ethiopia). The policy usually related to money and credit control, economic growth and help for price stabilization.

Monetary policy also regarded as useful for achieving equilibrium in the balance of payment (BOP) and exchange rate stabilization (Ghatak, 1981 and 1972).

In Ethiopia the majority of people lives in rural area of the country and agriculture is the main and the only way to support their life. Agricultural activities are somehow primitive or not civilized. For example they still use ox to do the farming activities.

Almost all of the people in rural area use paper money just for transaction purpose. Even if they want to use it as a store of value, they just keep the money under their pillow or they save it in the informal sector like "iquib", "idir", "mahiber" etc . And most importantly most of the population in the rural area is illiterate or they do not have any idea about interest rate and the like, so the change in interest rate does not affect these people.

The financial system in Ethiopia, like in many other developing countries is characterized by a financial dualism. It comprises of the formal and informal financial institutions.

The formal (organized) institutions consist of the central bank, commercial banks, development bank, insurance companies, micro-financing institutions and formal saving and credit unions or cooperatives. The informal (unorganized) financial institutions on the other hand, include the traditional informal money markets like iquib, idir, mahiber, usury and the parallel foreign exchange market.

The financial sector in Ethiopia is underdeveloped. Bank branch population ratio with a branch serving to people indicates that Ethiopia is one of the most under banked economies.

Money and capital markets are rudimentary that there is only a thin primary market for treasury bills and weak inter-bank money market. While except government issued bonds, all types of capital markets including stock exchange and equity markets are weak. Although periodic revisions have been made to maintain positive real interest rate, interest rates are not fully market determined.

The floor interest rate for saving deposits is still controlled by the National Bank of Ethiopia (NBE). The lending interest rate is freed to be determined by market forces since January 1998. The banking sector is concentrated in major cities and towns. Given the absence and poorly developed capital and financial market in Ethiopia, the paper would like to identify what factor determine the demand for real money balance .

### **1.3 Objectives of study.**

#### **1.3.1 General objective**

The general objective of this paper is to find out

- The determinants of money demand in Ethiopian economy after the reformation period of 1994.

#### **1.3.2 Specific objective**

The specific objectives are:

- The proper identification of money demand determinants in Ethiopia after the reformation period, 1994.
- Test of the degree of determination of each independent variable i.e (gross domestic product, expected inflation rate, expected exchange rate and expected interest rate on saving deposit.)
- Test whether there is a stable relationship between the dependent and independent variable.

### **1.3.3 Scope of the study**

This paper only emphasizes on factor determining the demand for real money demand in Ethiopian context after the reformation period of 1994 up to 2014. Particularly the paper emphasized on transaction motives, precautionary motives and speculative motives demand for money.

## **1.4 Data and methodology**

### **1.4.1 Source of data**

Data series for the variables are obtained from different sources, such as minister of finance and economic development (MOFED). Data for opportunity cost variables such as interest rates and inflation rates are obtained from annual report and Quarterly Bulletins of National Bank of Ethiopia. Narrow and broad money are collected from various issues of Quarterly Bulletins of National Bank of Ethiopia. GDP (gross domestic product) and annual exchange rate figures are obtained from the Central Statistics Authority (CSA) and annual report of National Bank of Ethiopia (NBE) respectively.

### **1.4.2 Model specification**

The quantity theory include income as the only variable in explaining the demand for money, however, income velocity of money is more subject to short run variation.

GDP (gross domestic product) and interest rate are scale variables. Interest rate is relevant in the demand for money in developing countries as there exist certain link between non organized and organized money market.

Expected inflation rate is one of the explanatory variable in the demand for money function. Expected inflation rate is a more appropriate proxy for opportunity cost of holding money.

Inflation rate and exchange rate are opportunity cost variables. They relate the holding of money to the attractiveness of the other asset. (Ghatak: 1995). And exchange rate is also included in the model.

Generally money demand determinants are formulated in real terms. A simple model reflecting the characteristics of Ethiopian money demand function is specified as follows.

Linear form  $Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + \dots$  (Koutsoyiannis, 2001)

$$MD = B_0 + B_1GDP + B_2P + B_3E + B_4I$$

In log linear form appeared to be

$$\text{Log MD} = B_0 + B_1\text{LogGDP} + B_2P + B_3\text{Log E} + B_4I$$

Where

**MD:** demand for money

**Log (GDP):** gross domestic product

**P:** expected inflation rate

**Log (E):** expected exchange rate

**I:** expected interest rate on saving deposit.

The log form is very convenient since the coefficients can be directly interpreted as elasticity. GDP and exchange rate are in Log form but expected inflation rate and interest rate are without Log form because they are negatives and enter in level term and as a result it makes the Log unnecessary. In addition, one of the money demand determinant, which is degree of depreciation or appreciation of domestic currency against foreign (Ronda: 1999),



is excluded because in Ethiopia foreign currency is available as a result of open nature of the economy.

### **1.4.3 Method of Analysis**

In this study descriptive and econometric analysis methods are used. The econometric analysis includes the following

**i. Empirical analysis,**

Variables will be interpreted using the following statistical test

- **R<sup>2</sup> or coefficient of determination**, which measures goodness of fit.
- **F - Test**. This test tell us about the significance of the whole parameters in the model ( koutsoyiannis, 2001) and
- **T - Test** which tell us about the significance of the individual parameters in the model ( koutsoyiannis, 2001)

**ii. Graphical analysis**

The research also use some graphs and interpret the result of each independent Parameter in relation with the dependent variable.

### **1.5 Significance of the study**

As pointed out earlier, Understanding of the major determinants of money demand and achieving stable money demand function plays a significant role in monetary policy implementation. This paper may contribute to the proper identification of money demand determinants in Ethiopia after the reformation period 1994. Partially it helps to make powerful influence on the country's economic activity.

Both theory and empirical studies seem to conclude that macroeconomic policies matter in influencing economic performance (Fisher: 1991). One of the reasons why the money demand function is widely researched is that demand for money lies at the heart of

macroeconomic policies (Adam: 1999). Money is linked to changes in economic variables that affect all of us and are important to the health of the economy (Mishkin: 1998) Moreover, testing the stability of parameters of the determinants of money demand function is important as it indicates the effectiveness of the conduct of monetary policy. This is because that the demand for money is a link between economic activities and monetary policy (Al-Saji, 1998). Stability of the money demand function that refers to constancy of the coefficients of the explanatory variables and changes in variances are crucial to studies of money demand function. Hence, the determinants of demand for money play a pivotal role in selecting appropriate policy actions.

## **1.6 Limitations**

The basic limitations of the study include:

- Most of the people use paper money just simply for transaction purpose, even if they want to use paper money as a store of wealth
- The formal financial sector of Ethiopia like bank, insurance and others are concentrated on cities. That is, much far from rural people. The result of this is the people save their money in the informal sector like (“iquib, idir, mahiber---)
- The financial sector in Ethiopia is underdeveloped. Like (banking, insurance, money and capital markets) are not developed.

## **1.7 Organization of the study**

This paper is organized in four chapters. The first one is the proposal part. In the second chapter attempt is made to provide a theoretical and empirical analysis from related literature. In the third chapter analysis of the data obtained from secondary source is given. The final chapter conclude the overall notion of the paper and try to recommend some policy options regarding the study

## **Chapter two**

### **Literature review**

#### **Theoretical literature**

#### **2.1 Definition and function of money**

##### **2.1.1 Definition of Money stock**

The money balance taken in the study is broad money supply, which is the sum of narrow money (currency in circulation plus demand deposit) plus quasi money (saving and time deposit). Although sir ram ,1999 ( cited in Fofanah ,2004), in his empirical survey indicated that narrowly defined monetary aggregates is a better aggregate for policy formulation in LDCs there is also equally important argument in appropriateness of broad definition of money (M1) for developing countries.

In the words of Jenkins (1999) broad money is both an asset that can be used for transaction purposes and an alternative store of value yielding interest income. Thus broad definition of money is estimated as appropriate variable to be modeled.

The money supply can include cash, coins and balances held in checking and savings accounts. Economists analyze the money supply and develop policies revolving around it through controlling interest rates and increasing or decreasing the amount of money flowing in the economy. Money supply data is collected, recorded and published periodically, typically by the country's government or central bank. Public and private sector analysis is performed because of the money supply's possible impacts on price level, inflation and the business cycle

There are different measures of money supply. Not all of them are widely used and the exact classifications depend on the country.

M0 and M1, also called narrow money, normally include coins and notes in circulation and other money equivalents that are easily convertible in to cash. M2 includes M1 plus short term time's deposits in bank and 24-hour money market fund. M3 includes M2 plus long

term time deposits and money market funds with more than 24- hour maturity. The exact definitions of these measures depend on the country. M4 includes M3 plus other deposits. The term broad money is used to describe M2, M3 or M4, depending on local practice.

Fiat money is an intrinsically worthless object, such as paper money, that is deemed to be money/legal tender by law or fiat (order) of the government. To place into historical context, one could think of three phases concerning the development of money.

- First, money itself was a valuable object, such as gold.
- Second, paper money circulated, but this money was backed up by holdings of gold, and indeed could be converted in to gold as a fixed price at any time.
- Third, paper money circulated, but it was not backed up by anything other than the government's promise that it will refrain from printing too much money so as to make it worthless. Since Bretton woods, almost all paper money is of this type.

### **2.1.2 Functions of Money**

Money is often defined in terms of the three functions or services that it provides. Money serves as a medium of exchange, as a store of value, and as a unit of account.

#### **I. Medium of exchange.**

Money's most important function is as a medium of exchange to facilitate transactions. Without money, all transactions would have to be conducted by barter, which involves direct exchange of one good or service for another. The difficulty with a barter system is that in order to obtain a particular good or service from a supplier, one has to possess a good or service of equal value, which the supplier also desires. In other words, in a barter system, exchange can take place only if there is a double coincidence of wants between two transacting parties. The likelihood of a double coincidence of wants, however, is small and makes the exchange of goods and services rather difficult. Money effectively eliminates the double coincidence of wants problem by serving as a medium of exchange that is accepted in all transactions, by all parties, regardless of whether they desire each other's goods and services.

## **II. Store of value.**

In order to be a medium of exchange, money must hold its value over time; that is, it must be a store of value. If money could not be stored for some period of time and still remain valuable in exchange, it would not solve the double coincidence of wants problem and therefore would not be adopted as a medium of exchange. As a store of value, money is not unique; many other stores of value exist, such as land, works of art, and even baseball cards and stamps. Money may not even be the best store of value because it depreciates with inflation. However, money is more liquid than most other stores of value because as a medium of exchange, it is readily accepted everywhere. Furthermore, money is an easily transported store of value that is available in a number of convenient denominations.

## **III. Unit of account.**

Money also functions as a unit of account, providing a common measure of the value of goods and services being exchanged. Knowing the value or price of a good, in terms of money, enables both the supplier and the purchaser of the good to make decisions about how much of the good to supply and how much of the good to purchase.

## **2.2 Theories of money demand**

The demand for money is closely related function to the definition of money. As we have seen, money can be defined in quite different ways. Thus, the demand for money will be different depending the combination of assets that are included in specific monetary aggregates.

The standard approaches to the demand for money focus on narrow concept of money as it is defined by the money stock. However, with some modifications a theory of the demand for broad monetary aggregates can be developed (Bofinger ,2001)

In this subsection, I shall see the classical, Keynesian and the monetarist theories regarding the theory of demand for money. Briefly in the classical theory it is argued that monetary forces do not affect movement of the real variables like output and employment in the

economy. In Keynesian theory it is suggested that a change in money supply may change the level of output via interest rates.

The monetarist school, headed by Friedman, contends that the classical rather than the Keynesian theory would be availed as long as money can affect real variables in the short run but only nominal magnitudes in the long run (Ghatak, 1995)

## **2.2.1 Classical Economics**

### **The Quantity Theory of Money**

The Quantity Theory of Money seeks to establish that, in the long run, the price level/ rate of inflation is determined by the level/ rate of increase of the money supply. Although the Quantity Theory of Money is an extremely old proposition, it was first formalised in the early part of the 20<sup>th</sup> century by Yale economist, Irving Fisher and later by a group of Cambridge economists, Alfred Marshall and most notably A. C. Pigou.

#### **(I) Fisher's Transactions Approach**

This approach first emerged in Fisher's book *The Purchasing Power of Money* (1911). For most economists of that period, money was viewed solely as a means of exchange. The only reason for holding money was to facilitate transactions. Fisher's analysis commences with a simple identity (a statement that is by definition true), sometimes referred to as the equation of exchange.

**$MV_t = PT$**  where

- $M$  = Money Supply
- $V_t$  = Transactions Velocity of Circulation of money (the number of times the money stock changes hands per period).
- $P$  = Price level.
- $T$  = the number of Transactions undertaken per period.

Note that

$MV_t$  = money stock \* number of times the money stock is spent per period

= total spending per period.

PT = Price of goods & services \* volume of goods & services bought per period

= total expenditure per period.

Thus, at first sight, the Quantity Theory is an innocuous tautology. To turn this identity into a theory of price determination, Fisher made further assumptions about the nature of each variable.

- M, the money stock was taken to be exogenously determined by the monetary authorities and independent of the other 3 variables
- $V_t$ , the velocity of circulation was assumed to be more or less constant and was determined by conditions in the financial system that tend to change very slowly. Again, V was thought to be independent of M, P & T.
- T, the number of transactions per period was also taken as fixed. Recall that Classical scholars believed that in the long term, output tended to be at or near the full employment level. The number of transactions was viewed as fixed at any given level of income.
- P, the price level was determined by the interaction of the 3 other factors.

Thus,

$$MV_t = PT$$

This suggests that the price level is determined by the money supply. T is likely to be extremely difficult to calculate or even conceptualize and V is not an independent variable.  $V_t$  is a residual which is generally derived given knowledge of the other 3. i.e.  $V_t = (PT)/M$ .

## **(II) The Cambridge Cash Balance Approach.**

Fisher's approach can be viewed as deterministic. Essentially, Fisher argued that, given the full employment volume of transactions and the speed with which the financial system could process payments, the quantity of money that agents required to hold was effectively determined.

Marshall, Pigou and colleagues took a radically different tack. Like Fisher, the Cambridge School assumed that money was only held to expedite transactions and had no further purpose. Thus, if the money supply increased, agents holding the increased money stock would seek to get rid of it. However, the emphasis in this approach concentrated on establishing the quantity of money that agents would voluntarily desire to hold. The Cambridge school were in effect attempting to set out a theory of the demand for money.

The Cambridge approach emphasises that there are alternatives to holding money in the shape of shares and bonds. These assets yield a return which can be viewed as the opportunity cost of holding money. As interest rates rise, agents will economise on money holdings and vice versa.

Another factor that will influence money holdings is the expected rate of inflation. If inflation is expected to be high, then the purchasing power of money will fall. This will prompt agents to buy securities or commodities as a hedge against inflation.

We can set out the Cambridge cash balance approach as follows

$$M^D = kPy$$

$$M^D = M^S$$

Where  $k = k [E (\text{inf.}), \mathbf{r}, u]$

This sets out that  $M^D$  is some fraction  $k$  of nominal GDP where  $k$  depends on expected inflation, interest rates/returns and  $u$ , a set of unspecified factors which may influence money demand. Note that  $\mathbf{r}$  is a vector of returns reflecting an appreciation that agents had a choice of assets such as shares and bonds.

The Cambridge cash balance equation can be recast to facilitate comparison with Fisher's equation of exchange.

$$M^S = kPy = (1/V)Py.$$

In this formulation,  $V$  can be construed as the income velocity of circulation. As with the Fisher approach,  $k$  was not regarded as fixed but rather was viewed as a stable and



predictable function of its determinants. In the long run, changes in the money stock would eventually lead to proportional changes in the price level.

The Cambridge approach is universally regarded as the superior account and it forms the basis of later developments in the demand for money by Keynes, Milton Friedman and others.

### **(III) The Transmission Mechanism**

The transmission mechanism sets out the process by which a change in the money stock affects economic activity. In the classical context this requires a clear explanation of how  $\Delta M \rightarrow \Delta P$ . Classical economists argued that there would be both a direct and indirect mechanism. The direct mechanism is the direct influence of a change in M on expenditure and the price level whilst the indirect mechanism operates through the interest rate.

To understand this fully, we must be more specific about the definition of money. Money can be narrowly conceived of as notes & coins in circulation. However, bank deposits can also be properly regarded as a component of the money stock. Classical economists focussed on the ability of banks to create money through the expansion of loans.

Fisher restated his equation of exchange to incorporate the banking sector. Thus,

$$PT \equiv MV + M'V'$$

Where M is quantity of currency (termed primary money by Fisher)

V is the velocity of circulation of currency

M' is the quantity of bank deposits

And V' is the velocity of circulation of deposit money

Assume that M (the quantity of primary money) rises. This could be achieved by the central bank buying bonds and securities from the non-bank private sector and paying for these purchases with cash. This would raise prices directly via the direct mechanism.

Fisher demonstrated that the emergence of inflation would result in a divergence between the real and nominal rates of interest.

$$R_t = r_t + \Delta P_t^e$$

Where  $R$  is the nominal rate of interest,

$r$  is the real rate of interest, and

$\Delta P_t^e$  is the expected rate of inflation

The Classical theorists viewed the interest rate as 'the reward for waiting'. If agents were to be persuaded to forego current consumption, they would require to be compensated with greater volume of consumption in a later period. Thus, the real rate of interest reflects the reward in terms of actual goods and services required to persuade agents to save. If  $r = 5\%$ , this suggests that agents require a 5% more goods and services in future if they are to be tempted to forego 1 unit of current consumption.

Note that in the preceding account, prices remained constant. If prices are rising by 5%, the nominal rate of interest would have to be 10% in order to ensure a 5% rise in actual goods and services as a reward for waiting.

Hence, Fisher argued that an increase in the primary money stock would initially serve to drive up prices. The increase in inflation would cause the nominal rate of interest to rise above the real rate. However, Fisher contended that the rise in the nominal rate would be insufficient to maintain the real rate at its equilibrium level. Thus, following a price increase, the real rate of interest would fall. This would result in an increase in the demand for loans by borrowers.

Fisher argued that banks would increase the volume of loans at the lower real rate thus increasing the volume of deposits,  $M'$ . The expenditure made possible by these loans drives up the price level. Although in the short run, this increased spending may increase the number of transactions, the long run impact of the direct and indirect mechanisms would result in a rise in the price level proportional to the rise in the money supply.

### **2.2.2 Keynes's Liquidity Preference Theory**

In his famous 1936 book *The General Theory of Employment, Interest, and Money*, Keynes developed a theory of money demand which he called liquidity preference theory. Keynes abandoned the classical view that velocity was a constant, and emphasized the importance of interest rates. He postulated that there are three motives behind the demand for money: the transactions motive, the precautionary motive, and the speculative motive.

Economists developed more precise theories to explain the three Keynesian motives for holding money. A key focus of this was to understanding better the role of interest rates in the demand for money.

#### **(I) Transactions motive.**

Keynes emphasized that this component of the demand for money is determined primarily by the level of people's transactions. The transactions demand for money arises from the lack of synchronization of receipts and disbursements. In other words, people aren't likely to get paid at the exact instant you need to make a payment, so between paychecks people keep some money around in order to buy stuff. Keynes believed that these transactions were proportional to income, like the classical economists, he considered the transactions component of the demand for money to be proportional to income.

William Baumol and James Tobin independently developed similar demand for money models, which demonstrated that even money balances held for transactions purposes are sensitive to the level of interest rates. They considered a hypothetical individual who receives a payment once a period and spends it over the course of this period in developing their models. In their models, money which earns zero interest is held only because it can be used to carry out transactions. The conclusion of the Baumol-Tobin analysis is as follows: as interest rates increase, the amount of cash held for transaction purposes will decline, which in turn means that velocity will increase as interest rates. The transactions component of the demand for money is negatively related to the level of interest rates.

## **(II) Precautionary motive.**

Keynes also recognized people hold money not only to carry out current transactions, but also as cushion against an unexpected need. Because people are uncertain about the payments they might want, or have, to make. If people don't have money with which to pay, they will incur a loss. When you are holding precautionary money balances, you can take advantages of the sale. Keynes believed that the amount of precautionary money balances people want to hold is determined primarily by the level of transactions that they expected to make in the future and that these transactions are proportional to income. So he considered the demand for precautionary money balances to be proportional to income.

We know that there are lots of benefits of holding precautionary money balances, but weighed against these benefit must be the opportunity cost of the interest forgone by holding money. The more money an individual holds, the less likely he or she is to incur the costs of illiquidity. But the more money the person holds, the more interest he or she is giving up.

As interest rates rise, the opportunity cost of holding precautionary balances rises, and so the holdings of these money balances fall. Therefore, the precautionary demand for money is negatively related interest rates.

## **(III) Speculative motive.**

The transactions motive and the precautionary motive for money emphasized medium-of-exchange function of money, for each refers to the need to have money on hand to make payments. Keynes agreed with the classical Cambridge economists that money is a store of wealth and called this reason for holding money the speculative motive. He also considered that wealth is tied to closely to income; the speculative component of money demand would be related to income. Keynes believed that interest rates have an important role to play in influencing the decisions regarding how much money to hold as a store of wealth.

Tobin developed a model of the speculative demand for money that attempted to avoid the shortcoming of Keynes's analysis. Tobin assumed that most people are risk-averse, and the return of money is zero. Bonds can have substantial fluctuations in price, and their returns

can be quite risky and sometimes negative. When the expected return on bonds exceeds returns on money, people might want to hold money as a store wealth because it has less risk. Tobin analysis also shows that people can reduce the total amount of risk in a portfolio by diversifying (by holding both bonds and money). His model suggests that people will hold bonds and money simultaneously as stores of wealth. Tobin attempted to improve on Keynes's rationale for the speculative demand for money, but he was only partly successful.

Keynes divided the assets that can be used to store wealth into two categories: money and bonds. He also asked why individuals would decide to hold their wealth in the form of money rather than bonds. Keynes assumed that the expected return on money was zero in his time, unlike today. For bonds, there are two components of the expected return: the interest payment and the expected rate of capital gains. As we know, when interest rates rise, the price of a bond falls. If you expect interest rates to rise, you expect the price of the bond to fall and suffer negative capital gains. In this case, people would want to store their wealth as money because its expected return is higher; its zero return exceeds the negative return on the bond.

Keynes assumed that individuals believe that interest rates gravitate to some normal value. When interest rates are below the normal value, people expect the interest rate on bonds to rise in the future and so expect to suffer capital loss on them. Therefore, people will be more likely to hold their wealth as money rather bonds, and the demand for money will be high. And contrariwise, they will be more likely to hold bonds than money, and the demand for money will be quite low. Therefore, money demand is negatively related to the level of interest rates.

Keynes carefully distinguished between nominal quantities and real quantities. He reasoned that people want to hold a certain amount of real money balances (an amount that the three motives indicated would be related to real income  $Y$  and to interest rates  $i$ ). Keynes developed the following demand for money equation, known as the liquidity preference function, which says that the demand for real money balances  $M_d/P$  is a function of  $i$  and  $Y$ :

$$M_d/p = f(i, Y_+)$$

Where the minus sign below  $i$  in the liquidity preference function means that the demand for real money balances is negatively related to the interest rate, and plus sign below  $Y$  means that the demand for real money balances and real income  $Y$  are positively related. Keynes thought that the demand for money is related not only to income, but also to interest rates.

Because the transactions motive and precautionary motive demand for money is positively related to real income  $Y$ , speculative motive demand for money is negatively related to interest rate ( $i$ ),

The demand for real money balances  $Md/P$  can be rewritten as

$$Md/p=L_1(Y)+L_2(i)$$

Where  $L_1$  means the transactions demand for money;

$L_2$  means the speculative demand for money.

By deriving the liquidity preference function for velocity  $PY/M$ , we can see that Keynes's theory of the demand for money implies that velocity is not constant but instead fluctuates with movements in interest rates. The liquidity preference equation can be rewritten as  $P/Md=1/ f(i, Y)$ . Multiplying both sides of this equation by  $Y$  and recognizing that  $Md$  can be replaced by  $M$ . Because they must be equal in money market equilibrium, we solve for velocity:

$$V=PY/M=Y/f(i,Y)$$

Keynes's liquidity preference theory of the demand for money indicates that velocity has substantial fluctuations as well.

### **2.2.3 The monetarist demand for money**

The monetarists' case is advocated strongly by a number of economists, the most prominence of whom is Professor Friedman. (1956) of Chicago University. To state in a very simple way, the modern quantity theory argues that a change in money supply will change the price level as long as demand for money is stable. Such change also affect the

real values of national incomes and economic activity but in the short run only. (Ghatak , 1995). Friedman (1956) cited in Bo finger (2001) argued that the demand for money should be treated in the same way as he demand for goods and services. Friedman explains this in the following way.

### **Friedman's Modern Quantity Theory of Money**

Milton Friedman developed a theory of the demand for money in his famous article, "The Quantity Theory of Money: A Restatement", in 1956. Freidman's analysis of demand for money is close to Keynes and the Cambridge economist than it is to fisher's. Friedman considered that the demand for money must be influenced by the same factors that influence the demand for any asset.

Friedman then applied the theory of asset demand to money. The demand for money is a function of the resources available to individuals and expected returns on other asset relative to the expected return on money. Friedman regarded his model of the demand for money as follows:

$$M_d/P = f (Y_p, r_b, r_m, r_e, \pi_e, W, u)$$

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

where  $M_d/P$  = demand for real money balances;

$Y_p$  = permanent income, Friedman's measure of wealth;

$r_m$  = expected return on money;

$r_b$  = expected return on bonds;

$r_e$  = expected return on equity(common stock);

$\pi_e$  = expected inflation rate;

$W$  = proportion of human wealth and non-human wealth;

$u$  = other factors influencing demand for money

The demand for an asset is positively related to wealth, money demand is positively related to Friedman's wealth concept (permanent income). Permanent income has much smaller short-run fluctuations because many movements of income are transitory. Friedman regarded permanent income as a determinant of the demand for money is that the demand for money will not fluctuate much with business cycle movements. Friedman categorized them into three types of assets: bonds, equity, 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 expected return on money  $r_m$  is influenced by

- (1) The services provided by banks on deposits;
- (2) The interest payments on money Balances.

In Friedman's money demand function, the  $r_b - r_m$  and  $r_e - r_m$  mean the expected return on bonds and equity relative to money; when they raise, the relative expected return on money falls, and the demand for money falls.  $\pi - r_m$  means the expected return on goods relative to money. When it rises, the expected return on goods relative to money rises, and the demand for money falls

Milton Friedman used a similar approach to that of Keynes and the Cambridge economists in his money demand theory. Friedman treated money like any other asset; he used the theory of asset demand to derive a demand for money that is a function of the expected return on money and permanent income.

In contrast to Keynes, Friedman viewed money and goods as substitutes, people choose between them when deciding how much money to hold. The assumption that money and goods are substitutes indicates that changes in the quantity of money may have direct effect on aggregate spending. Friedman did not take the expected return on money to be a constant as Keynes did.

Unlike the Keynes's theory, Friedman's theory suggests that changes in interest rates should have little effect on the demand for money, and random fluctuations in the demand



for money are small and that the demand for money can be predicted accurately by the money demand function. He believed that the demand for money is stable and insensitive to interest rate movements.

The recent debate between the monetarists and the Keynesian centers around the equation of changing aggregate demand by monetary or fiscal policies. The Keynesian point out that only fiscal policy can change level of income by changing aggregate demand whereas the monetarist argue that aggregate demand can be changed only by monetary policies.

The monetarists case rest on the working of a vertical or near vertical LM-curve, this implies the demand for money is very inelastic to change in interest. Similarly, the “Keynesians” case rests on the working of vertical near vertical IS schedule with a normal LM-curve. This implies a very low elasticity of investment function with respect to change on the interest rates (Ghatak 1995).

### **2.3 Review of empirical studies**

The empirical literature on money demand function in LDCs (least developed countries) has provided little that is new in the way of approaches to the problem of estimation compared to large amount of equivalent work under taken for developed countries for summary of this work for developing countries. (Ladier, 1993).

Fase and winder (1999) quoted in Bo finger (2001) found the demand for money to Germany that the income elasticity is significantly higher than 1 that is 1.4. This outcome can be explained by the influence of wealth on the demand for money. In such countries monetary wealth of private households has been growing more strongly than the nominal GDP.

Econometrics test for Europe which was made in 1990's come to the conclusion that a European money demand is stable and above all more stable than the national money demands.

Econometrics test for the money demand in the United States turned out to be some how difficult matter. The reason for this is related to primarily substantial changes in the behavior of the veracity of money.

A study of demand for broad money in turkey by Civier (2003) estimated that long run demand for real balance in turkey depends up on real income, on its own interest rate , interest rate on governmental securities , inflation and expected exchange rate . Significance of the expected exchange rate variables indicates the existence of currency substitution in turkey. The dynamics of money demand are important, the inflation and the income effects are much smaller in the short run than the long run. The result also reveals that the demand for broad money in turkey is stable, despite the economic reforms and financial crises.

A study on demand for narrow and broad money in Uganda by Atigini-Ego Mathews (1996) cited in chalachew (2005) estimated real money balance and obtained that credit restraints, as an opportunity cost variable, is a strong determinants of real money balances. Model for narrow money is a good aggregate for monetary policy purpose. However, parameters stability is not achieved when broader monetary aggregate might be used as indicator of monetary conditions rather than targets.

Due (1982/83) cited in Ghatak (1995) considered the demand for money between 1960 and 1977 for wider range of countries ( Colombia , Costa Rica ,Egypt , Gabon, Ghana, Ivory coast ,Malaysia, Nicaragua, Nigeria ,Thailand, Togo and Tunisia) from the point of view of the appropriate income and opportunity cost variable to be incorporated in the money demand function, The result shows the inflation rate was statically significant for two countries only .

Another three researchers who provide empirical estimates of money demand function are Arise, Darrat, and Meyer (2000). They try to estimate the demand for money function for seven developing countries in Africa by taking in to consideration the significance of the non-monetized sector. Countries included in this study were Egypt, Gambia, Mauritania, Morocco, Niger and Somalia. They found that money holdings are significantly related to monetized real income and external influences. According to their estimation long run real

income elasticity revealed some evidence of economies of scale in cash management only for Niger, whereas money appears to be a luxury in the remaining countries. In addition they recommend that effective monetary policy thus should take in to account the response of domestic money holding to movements in foreign interest rates and exchange rates.

When we come to Ethiopia like to other LDCs, the empirical researches regarding money demand function are few in number as compared to the large amount of work that has been done in developed countries. Gemech(1993) as cited in Chalachew (2005) estimated money demand equation as a scale variable , index of coffee production as a proxy for the effects of monetization and expected exchange rates as an explanatory variables.

Consistence with theoretical predictions, the study found that money demand is positively related to income, the price level and the rate of monetization and negatively to expected depreciation of the exchange rate. He also obtains a long run high income elasticity of 1.2 which seems to owe to limitation of asset substitution and instability due to periodic economic disorder.

A similar study was made by Erget (1998) as cited in Chalachew (2005) who tried to formulate money demand function for Ethiopia using quarterly disaggregated data by taking real income , the price level , expected inflation ,parallel market, exchange rate , deposit rate and exchange rate premium. The result indicated that the model revealed very low adjustment towards equilibrium and inflation has significant effect in short run. Moreover, the parallel market exchange rate premium is found to have significant effect both on the short run and long run demand for real money balances.

## **2.4 overview of the determinants according to Ethiopian economy**

### **2.4.1 GDP growth**

Ethiopia has registered remarkable economic performance with annual growth averaging 10.9% over the past ten years. (United Nations development program country economic brief FEB/2014). This is double the Sub Sahara Africa and triples the world average growths over the past ten years. And has led to Ethiopia being rated as one of the fastest growing economies in the world. (United Nations development program country economic brief FEB/2014).

Huge public investments with focus on infrastructure and pro-poor sectors explain much of the economic performance from the expenditure side. Government investments have mainly been carried out from domestic resource mobilization and augmented by external resource inflows. Domestic savings has been growing significantly in the past few years from 12.8% of GDP in 2010/11 to 17.7% of GDP in 2012/13. (United Nations development program country economic brief FEB/2014). The newly introduced savings instruments (bonds) and expansion in financial services through the aggressive opening of banking branch networks have contributed to the surge in the domestic savings. From the production side, looking at the Major sectoral classifications the growth remained robust and broad based as all sectors registered positive and significant Growth.

The growth in the industry sector was very strong in the past three years. This sector was the highest performer in 2012/13 by registering 18.5% annual growth rate, which was buoyed by the construction boom and expansion in mining and manufacturing sub-sectors. Agriculture grew by 7.1%, recovering from 4.9 % growth in the previous year mainly attributed to increased crop production as a result of Increases in productivity and expansion of area under cultivation. The main reasons for the increase in the agricultural productivity and production were favorable weather and good rainfall, strengthened agricultural extension services, better access to agricultural inputs, improved access to market and pursue of enhanced policy and advocacy.(United Nations development program country economic brief Feb/2014) .

In 2012/13 the service sector registered 9.9% annual growth and stood out in terms of its contribution to the overall output. The service sector has slowly taken over the lead from agriculture in terms of its contribution to the gross national product. In 2012/13 the respective shares of agriculture, industry and service sectors in the GDP stood at 43%, 12% and 45%. (United Nations development program country economic brief Feb/2014). The share of the service sector to GDP increased from 38% to 45% in the past 10 years while the share of agricultural declined from 52% to 43% in the same period. (United Nations development program country economic brief Feb/2014). However, agriculture

will continue to be the main source of employment as the service sector has not been able to generate much employment. This implies though that the productivity of the much fewer service sector workers far outweighs labor productivity of the large number of people employed in the quality agriculture sector. It also means that the quality of jobs and wages/incomes in the service sector is higher than those in the agriculture sector

In this context, measures to raise productivity in the smallholder agriculture as well as to boost private investments in commercial agriculture is imperative to the growth and transformation of the whole economy through diversification and linkages with other sectors, improving the quality of employment and reducing rural poverty. Meanwhile, the industry sector has maintained modest increments over the years in terms of value added. 2012/13 was a markedly successful year in terms of maintaining macroeconomic stability and fiscal management as witnessed by inflation falling to a single digit, which had been a major challenge in the past two years.

#### **2.4.2 Inflation**

Historically Ethiopia has been one of the low inflation economies with average inflation rate of less than 5 %. Since 2006 however Ethiopia has no longer been considered a low inflation country and in July 2008 an all-time high inflation rate of 64 % was recorded. The major causes were the then high fuel and food prices shocks, weaker foreign exchange earnings, and rising demand for imports that depleted international reserves of the country. The highest price increase was observed in food, housing, fuel and transport services, making the urban poor the most vulnerable to the impacts of inflation.

Owing to strong policy measures and abated world price shocks inflation tumbled down to single digit in 2010 and 2011. Inflation re-emerged in 2012 and reached a peak of about 40 % in September 2012. Looking at the components, the food and nonalcoholic beverages category has been the main drivers of overall price movements. Both internal and external factors contributed to the hike again in inflation. Well-coordinated monetary and fiscal policy stance coupled with slowdown in the world commodity prices have resulted in significant decline in inflation.

Hence, year-on- year food and nonfood inflation rates contained back to single digits in 2013. In January 2014 while headline inflation became 7.8 %, food inflation tumbled down to 5.1 % and non-food inflation to 10.9 %. Although inflation is low compared to the previous two years there are signs of the rate increasing in recent months especially in the non-food category.(United Nations development program country economic brief Feb/2014) .

### **The cause of inflation rate in Ethiopia**

**1. Increase in the money supply** the IMF has reported that the broad money supply in Ethiopia has been growing relatively fast in recent years. In any case, the increase in the money supply leads to ‘too many birr chasing too few goods’ - resulting in high inflation rates. This is one of the causes of the rampant Ethiopian inflation rate.

### **2. The low interest rates (and negative real interest rates)**

**3. Souring oil prices** The soaring oil prices affect the cost of production in a negative way there by decreasing the supply of goods and services. The electricity outages and blackouts in the country will continue to affect the overall growth of the economy, in addition to making the consumer to suffer. How in the world Ethiopia, which nearly spends most of its foreign exchange earnings on oil imports.

**4. Increase in money supply from abroad** many reports indicate that between 35% and 40% of the Ethiopian government budget is financed through the so-called economic aid and ODA (Official Development Assistance) (Dr. Seid Hassan, 2008). The huge volume of foreign money entering the country bolsters the demand for goods and services, and as a result increases the risk of inflation

**5. Remittances:** there is no exact estimate of this amount; the amount of Ethiopian remittances is believed to be in the range of \$1.1 billion to \$1.4 billion every year. (Dr. Seid Hassan, May 2008). Even though remittances provide cushions to potential economic

shocks of a country and benefit receiving households, among other things, they exacerbate the “too many dollars chasing too few goods” scenario. The increased demand by those who receive and spend the remittances exacerbate the inflationary pressures created mainly by the existing shortages

**6. Shortages –both food and finished products** The real and major culprits behind the rampant inflation rates are, in fact, the existing shortages as evidenced by the fast rising food and finished product prices.

**7. Declining foreign exchange reserves** Just like any central bank, the central bank of Ethiopia holds these assets in gold, dollars, euros and securities of possibly other countries. Each country must have enough foreign exchange reserves to allow it to service its foreign debt and import goods and services. The foreign exchange reserves are used to back the country’s liabilities and its own currency. They are also used to manipulate and stabilize exchange rates. Shortages of foreign exchange reserves imply that the country will be unable to service its foreign debt and/or unable to import goods and services and important inputs used by domestic firms. If these reserves become dangerously low, capital flight and a dry-up of foreign loans may ensue. Both of these scenarios usually lead to a financial crisis. A financial crisis is a collapse of the currency, which is what is happening right now.

**8. Foreign debt:** The World Bank classifies Ethiopia as one of the highly indebted countries in the world. Ethiopia’s debt, being over \$2. 8 billion in 2006. after receiving a huge debt relief in recent years, is simply unsustainable. (Dr. Seid Hassan, May 2008)

**9. Rising world food Prices.** The rising world food prices, however, could have a devastating impact on the Ethiopian rampant inflation rates. This is so in part because the main causes of the country’s high inflation rates are food shortages and any food shortages in the rest of the world will just make things worse.

**10. Budget and Current Account Deficits:** A nation faces a budget deficit when the government spends more than it takes in as taxes. The budget deficit for 2007 was

expected to be \$740 million, with a debt/GDP ratio of close to 54.5%. (Dr. Seid Hassan, May 2008)

**11. The Monetization of Food Aid:** This is the money spent by aid organizations to help starving Ethiopians (known as cash funding). It has been reported that aid agencies and NGOs are locally buying some of the food aid that they deliver to needy Ethiopians.

### **2.4.3 Interest Rates**

The central bank's policy on interest rate is that it sets the minimum (floor) bank deposit rate, currently at 5 %, but the banks are free to pay above the minimum and to set their own lending rates. While the minimum bank saving rate was controlled at 5 %, average saving rate was 5.4 % and lending rate at 11.88 % in 2012/13. Real saving rates remained negative as the inflation rate is still higher than the nominal interest rate. The relatively insensitive nature of savers to interest rate, due to the absence of alternative financial instruments, has allowed the banks to hover around the minimum deposit rate (United Nations development program country economic brief Feb/2014) .

### **2.4.4 Exchange Rates**

The exchange rate (Birr against US dollar) continued to slowly depreciate while there was a slight decline in international reserves of the country. The National Bank of Ethiopia (central bank), follows a managed floating exchange rate regime where the local currency Birr is pegged to the US Dollar. Accordingly, drastic movements in the nominal exchange rate are not expected. The Birr continued to depreciate but at a very slow rate and it reached 18.19/US\$ at the end of 2012/13. This gradual depreciation is in line with the goal to enhance competitiveness of Ethiopian exports and attract FDI.

The average exchange rate of the Birr against US dollar in the official market showed annual depreciation of 5.4 % since 2011/12. In January 2014, the exchange rate reached 19.107 Birr/US\$, a 4.85 % depreciation since January 2013. (United Nations development program country economic brief Feb/2014) .



## **Chapter 3**

### **Data analysis and interpretation**

#### **3.1 Empirical data analysis**

This is the further transformation of the processed data to look for patterns and relationship between and/or among data groups by using inferential (statistical) analysis. The Statistical Package for Social Science (SPSS) version 16 was used to analyze the data obtained from secondary sources. In this section, the results of inferential statistics are presented. For the purpose of assessing the objectives of the study, regression analyses and Pearson's Product Moment Correlation Coefficient were performed. With the aid of these statistical techniques, conclusions are drawn with regard to the data and decisions are made with respect to the research objectives.

##### **3.1.1 Regression Analysis**

In this study multiple regressions was employed. Multiple regression analysis takes into account the inter-correlations among variables involved. This method also takes into account the correlations among the predictor scores (John Adams, 2007).

##### **Regression Functions**

The equation of regressions on this study is generally built around two sets of variables, namely dependent variable (broad money demand) and independent variables (gross domestic product, inflation rate, exchange rate and interest rate).

The basic objective of using regression equation on this study is to make the study more effective at describing, understanding and predicting the stated variables. The results of such analysis are explained in the table below.

### Model Summary

R Square	Adjusted R Square	Std. Error of the Estimate
.991	.988	.0442189

- a. Predictors: (Constant), interest rate, inflation rate, log Exchange, log GDP

Table 1 , table of goodness of fit (R-square )

Table 1 revealed that the correlation between the observed value of broad money demand and the optimal linear combination of the independent variables (gross domestic product, inflation rate, exchange rate and interest rate is 0.995, as indicated by multiple R. Besides, given the R- Square value of 0.991 and adjusted R- square value of 0.988, it may be realized that 99.10 % of the variation in performance can be explained by the independent variables. The remaining 0.90 % of the variance is explained by other variables not included in this study.

Generally money demand determinates are formulated in real terms. Accordingly, multiple regressions technique was used to explain the following relationships. Broad money demand (as dependent variable) on the selected linear combination of the independent variables.

### coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.514	.300		1.715	.107
	Log GDP	.783	.116	.957	6.746	.000
	Inflation rate	-.052	.129	-.014	-.398	.696
	Log Exchange	.129	.321	.051	.402	.694
	Interest rate	.111	.489	.007	.227	.824

- a. Dependent Variable: logM2D

Table 2 coefficient of the independent variables

The unstandardized coefficients **B** column, gives us the coefficients of the independent variables in the regression equation including all the predictor variables as indicated below.

$$\text{Log MD} = \text{B}_0 + \text{B}_1 \text{LogGDP} + \text{B}_2 \text{P} + \text{B}_3 \text{Log E} + \text{B}_4 \text{I}$$

$$\text{Broad money demand} = 0.514 + 0.783 (\text{gross domestic product}) - 0.052 (\text{inflation rate}) \\ + 0.120 (\text{exchange rate}) + 0.111 (\text{interest rate})$$

Table 2 further shows that, all the explanatory variables included in this study can significantly explain the variation on the dependent variable.

The standardized beta coefficient column shows the contribution that an individual variable makes to the model. The beta weight is the average amount the dependent variable increases or decrease when the independent variable increases or decrease by one standard deviation (all other independent variables are held constant).

As these are standardized we can compare them. Thus, the largest influence on the broad money demand is from the gross domestic product (0.957) and the next is exchange rate (0.051). On the other hand inflation rate with the beta value of (- 0.014) and interest rate with the beta value of (0.007) are the poorest predictor of broad money demand when it is compared with the other explanatory variables under study.

### **3.1.2 Pearson's Product Moment Correlation Coefficient**

In this study Pearson's Product Moment Correlation Coefficient was used to determine whether there is significant relationship between broad money demand, Gross domestic product, inflation rate, exchange rate and interest rate.

This section presents the results of Pearson's Product Moment Correlation on the relationship between independent variables and dependent variable.

To ascertain whether a statistically significant relationship exists between broad money demand, Gross domestic product, inflation rate, exchange rate and interest rate the Product Moment Correlation Coefficient was used.

The table (3) indicates that the correlation coefficients for the relationships between broad money demand and its independent variables are linear.

		Log(broad money demand)	LogGDP	inflation rate	log Exchange	interest rate
Log(broad money demand)	Pearson Correlation	1	.995**	.538*	.971**	-.425
	Sig. (2-tailed)		.000	.015	.000	.062
	N	20	20	20	20	20
LogGDP	Pearson Correlation	.995**	1	.555*	.971**	-.434
	Sig. (2-tailed)	.000		.011	.000	.056
	N	20	20	20	20	20
inflation rate	Pearson Correlation	.538*	.555*	1	.438	-.149
	Sig. (2-tailed)	.015	.011		.053	.530
	N	20	20	20	20	20
LogExchange	Pearson Correlation	.971**	.971**	.438	1	-.376
	Sig. (2-tailed)	.000	.000	.053		.103
	N	20	20	20	20	20
Interest rate	Pearson Correlation	-.425	-.434	-.149	-.376	1
	Sig. (2-tailed)	.062	.056	.530	.103	
	N	20	20	20	20	20

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 3 correlation table.

As it is clearly indicated in table 3 above, a strong positive relationship was found between Gross domestic product and broad money demand ( $r = 0.995$ ) and Exchange rate and broad money demand ( $r = 0.971$ ). Which are statistically significant at 99% confidence level. According to correlation result we can confidently say that the dependent variable has strong positive correlation with GDP; this means, one percent change in GDP will cause a significant change in the dependent variable.

The other variable is exchange rate for a nation's currency is the amount of one nation's money that can be obtained in exchange for a unit of another nation's money. For simplification purpose in this paper considers only two countries (Ethiopia and USA). given that the Ethiopian birr is quoted in terms of the USD .The variable(exchange rate) has a strong positive correlation with money demand which means the money demand is sensitive to small change in exchange rate and they have positive relation.

The correlation coefficient between inflation rate and broad money demand is ( $r = 0.538$ ), which are medium positive correlation coefficient. This indicated that statistically significant relationship.

In Ethiopia the major cause of inflation rate were high fuel and food prices shocks, weaker foreign exchange earnings, and rising demand for imports that depleted international reserves of the country. The highest price increase was observed in food, housing, fuel and transport services, making the urban poor the most vulnerable to the impacts of inflation.

The correlation coefficient between interest rate and broad money demand is ( $r = -0.425$ ), which are negative medium correlation relation. The demand for money also involves interest rate which is a price that has to be payed for its use. Here the interest rate has a weak negative correlation with the money demand. The reason to have a weak correlation is that in our country there is a weak financial sector and also most importantly the substantial part of the Ethiopian economy is non-monetized. the interest rate has a negative correlation which means the higher the interest rate the greater cost of holding money thus the opposite relation shows the lower the rate the higher the demand for money.

### 3.1.3 T - TEST

The **T-TEST** tell us about the significance of individual parameters. (Koutsoyiannis, 2001).

$$\text{Log MD} = B_0 + B_1 \text{LogGDP} + B_2 P + B_3 \text{Log E} + B_4 I$$

Given the information in the above model, whether the coefficients significantly determine the broad money demand or not can be tested using the T-test. I can postulate the following hypothesis.

$$H_0; B_1=0 \quad \text{and} \quad H_1; B_1 \neq 0$$

$$H_0; B_2=0 \quad \text{and} \quad H_1; B_2 \neq 0$$

$$H_0; B_3=0 \quad \text{and} \quad H_1; B_3 \neq 0$$

$$H_0; B_4=0 \quad \text{and} \quad H_1; B_4 \neq 0$$

The null hypothesis state that, holding inflation rate, exchange rate and interest rate constant, gross domestic product has no influence on broad money demand.. If the computed t-value exceeds the critical t-value at the chosen level of significance, then the null hypothesis is rejected.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.514	.300		1.715	.107
LogGDP	.783	.116	.957	6.746	.000
Interestrates	.111	.489	.007	.227	.824
LogExchange	.129	.321	.051	.402	.694
Inflationrate	-.052	.129	-.014	-.398	.696

Dependent Variable: logM2D

Table 4 T-test table.

$$\text{Log MD} = 0.514 + 0.783\text{Log GDP} - 0.052\text{P} + 0.120\text{E} + 0.111\text{I}$$

$$(0.300) \quad (0.116) \quad (0.489) \quad (0.321) \quad (0.129)$$

Nothing that  $B_1=0$  under the null hypothesis, using the two tailed t test, the computed t value 6.746 is exceeds the critical value. So the null hypothesis is rejected and that  $B_1$  is statistically significant; that is, significantly different from zero.

If the observed significance level is small enough, usually less than 0.05, the null hypothesis is rejected. And regarding the other three coefficients, as it can be observed from the above table 4, the observed significance level is greater than 0.05 and also the computed t-value is below the critical t-value at the chosen level of significance. Hence, the null hypothesis is not rejected and conclude that  $B_2, B_3$  and  $B_4$  is statistically not significant.

### 3.1.4 F - TEST

The other thing that we should see is the **F- TEST**. This tells us about the significance of the whole parameters in the model. (koutsoyiannis, 2001).

The F - statistics calculated by most regression programs can be used in multiple regression models to test the significance of the  $R^2$  statistic. The F- statistic with K-1 and N-K degrees of freedom allow us to test the hypothesis that none of the explanatory variables helps explain the variation of broad money demand about its mean . In other words, the F-statistics tests the joint hypothesis that  $B_1=B_2=B_3$  and  $B_4 = 0$ .

It can be show that  $F_{(K-1, N-K)} = \frac{RSS/(K-1)}{ESS/(N-K)}$

**RSS** \_ Residual sum of squares

**ESS** – Explained sum of squares

If the null hypothesis is true, then you would expect RSS,  $R^2$  and therefore F- statistics to be close to zero. Thus a high value of the F- statistics is a rational for rejecting the null

hypothesis. As F-statistics is not significantly different from zero, it can be concluded that the explanatory variable do little to explain the variation of dependent variable about its mean.

#### ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.116	4	.779	398.393	.000 <sup>a</sup>
	Residual	.029	15	.002		
	Total	3.145	19			

a. Predictors: (Constant), inflation rate, interest rate, log Exchange, log GDP

b. Dependent Variable: logM2D

Table 5, F-test table.

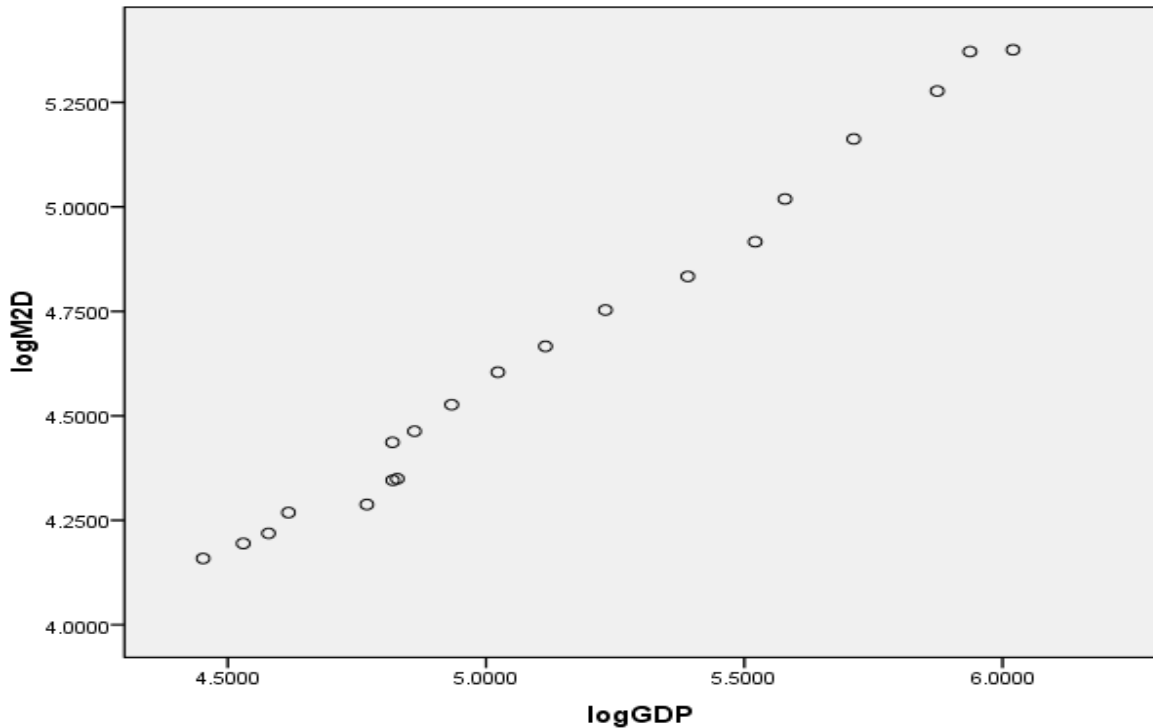
Finally, as we have observed from the above table 5 that provides an F-test for the null hypothesis it can be concluded that none of the explanatory variables are related to broad money demand, if the observed significance level is below 0.05, and also the computed F value is exceeds the critical value. Here we can clearly reject the null hypothesis  $F_{(4, 15)} = 398.393, p < 0.001$ ), so we can conclude that the value of F- test is statistically significant.

### 3.2 Graphical analysis

In this research graphical analysis is also employed and attempt is made to interpret the result of each independent parameter in relation with the dependent variable

The first graph shows the relation between the broad money demand and GDP (Gross domestic product).

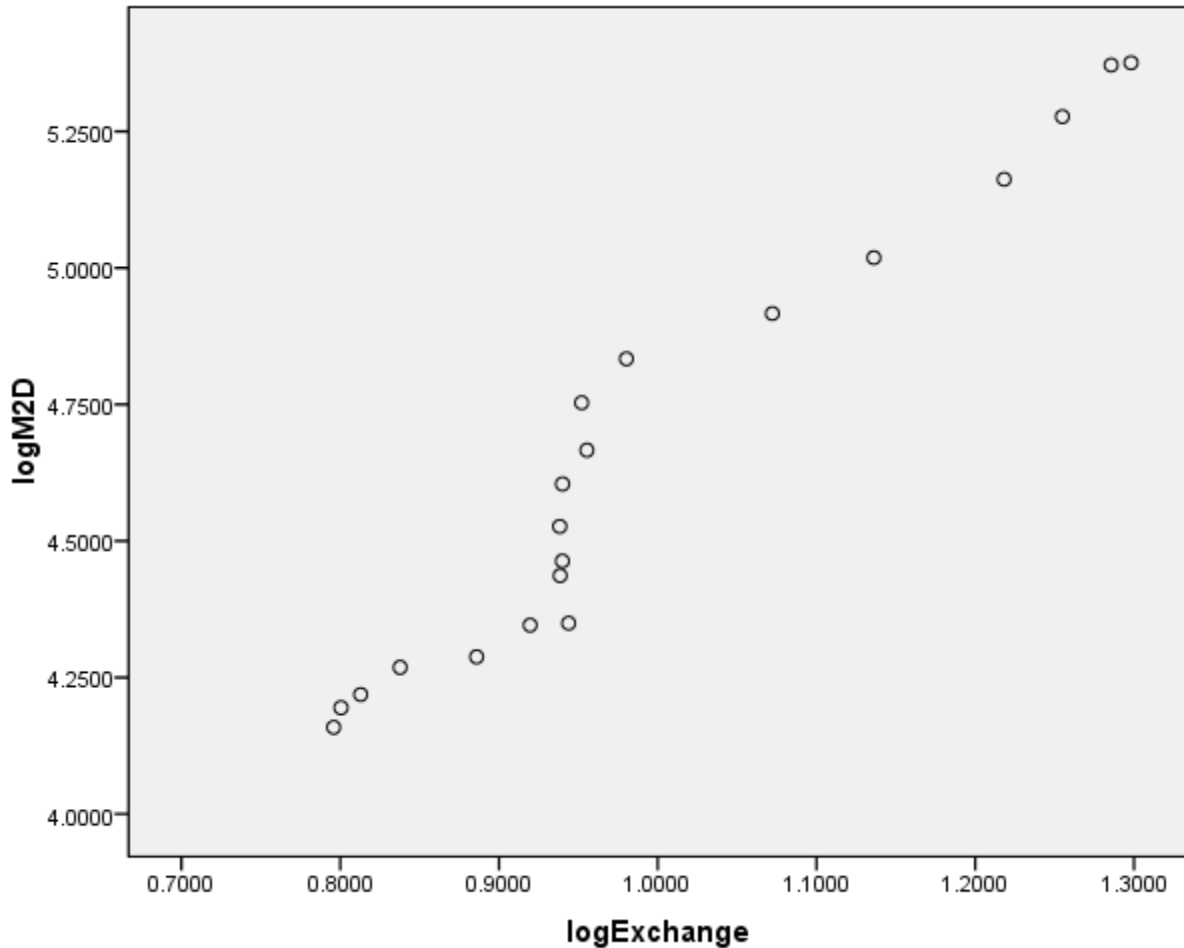




Graph 1 Relationship between GDP and broad money demand

The above graph has a positive slope which means there is a positive relationship between the GDP and broad money demand. The slope of the graph is somehow steeper which means small change in the GDP would cause a big change in the demand for broad money. This is so because people usually demand more money if their income rises, if their transaction increases and so on. We can see this thing in the GDP's relation with the demand for money. When one country's GDP increases, more product and service are produced and transaction increases for which they need more money. So as GDP increases the demand for money also increase.

The next one is the exchange rate graph

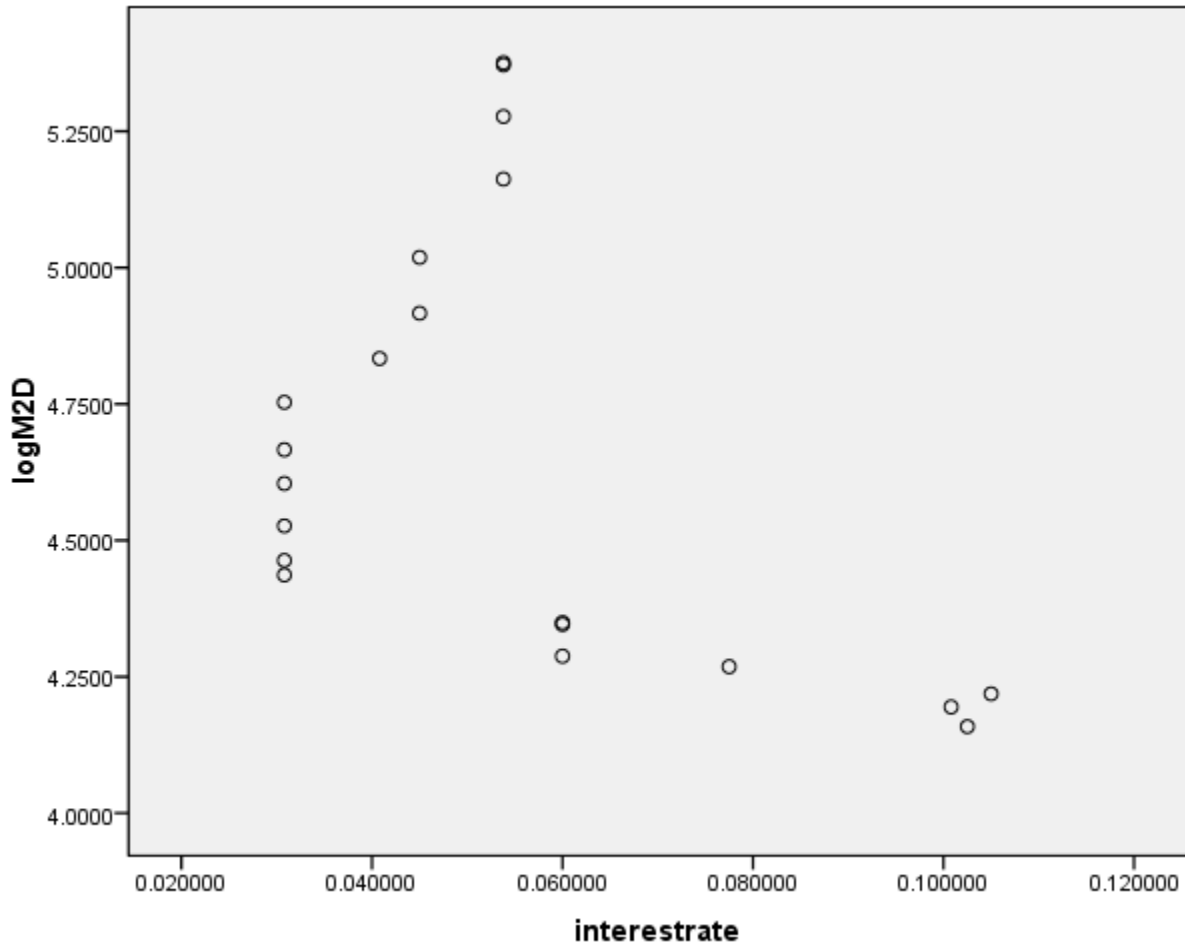


Graph 2 Relationship between exchange rate and broad money demand

As can be seen from graph 2, it slopes upward indicating that there is a positive relation between the exchange rate and the broad money demand. There is also another point we should see that the slope of the graph is somehow steeper. This means there is strong correlation between the variables under consideration. I.e., a small unit change in the exchange rate will cause a higher change to the same direction on the demand for broad money.

### The third one is the interest rate graph.

As we can see from the graph below there is a negative slope (negative relation between the interest rate and broad money)

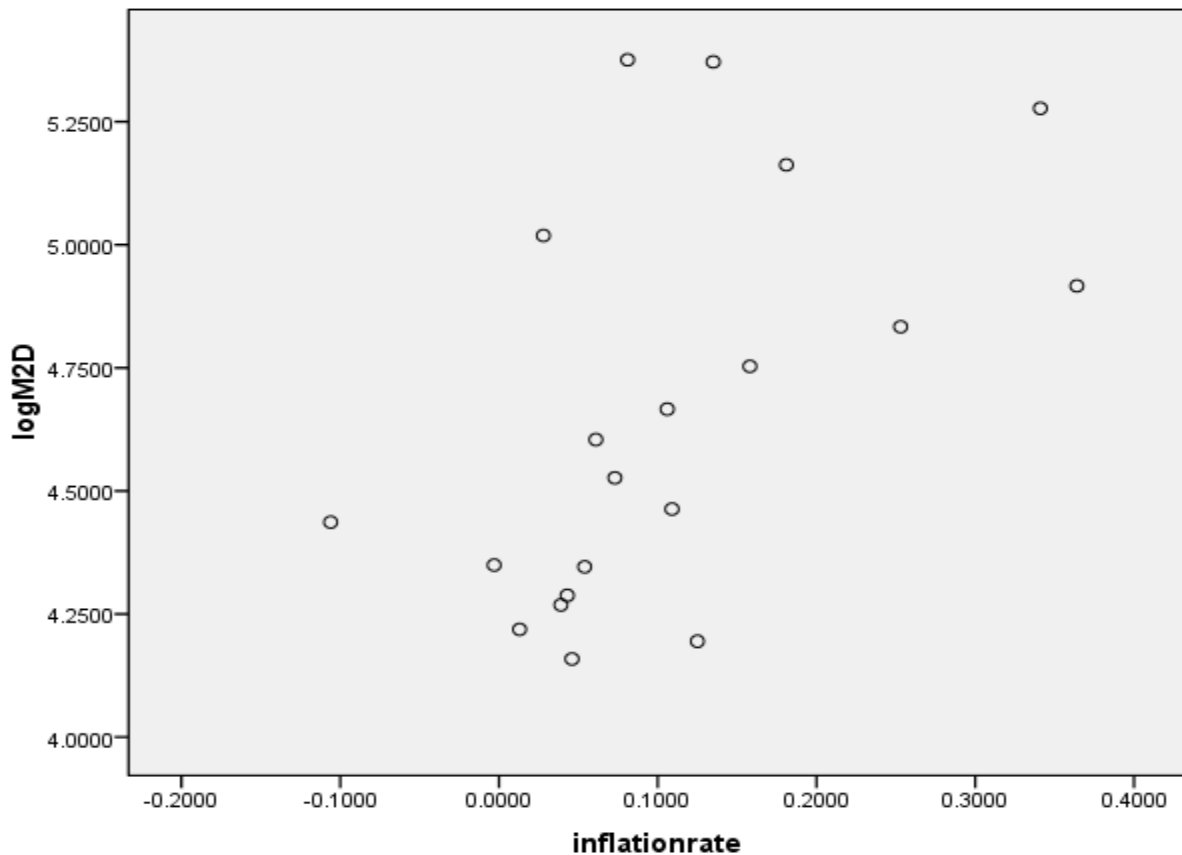


Graph 3 Relationship between interest rate and broad money demand

In other words the increase in an interest rate causes a decline in the demand for money. This is true because as we stated earlier interest rate is the price that has to be paid for the use of the money. So any rational person won't increase the consumption of one thing when its price increases. The same thing will happen to the demand for money when the interest rate increases.

But when we see the slope of the graph it is somehow flatter indicating that the magnitude of the impact of the interest rate on the demand for broad money is low.

## The last one is inflation rate graph



Graph 4 Relationship between inflation rate and broad money demand

Here in the above graph 4, it slopes upward indicating that there is a positive relation between the inflation rate and the broad money demand. There is also another point we should see that the slope of the graph is not steeper. This means there is no strong correlation between the variables under consideration. I.e., a small unit change in the inflation rate will cause a small change to the same direction on the demand for broad money. It can be concluded that the effect of the inflation rate is small just because of the knowledge of the people in the country.

In Ethiopia most of the people are living in the rural area which means the people have no idea about the inflation rate so they wouldn't change their demand in accordance with the going inflation rate.

## Chapter four

### Conclusion and Recommendation

#### 4.1 Conclusion

The major concern of this paper is identification of major determinants of the broad money demand function in Ethiopia.

The major variables considered for determination of broad money demand are

- GDP(gross domestic product)
- I ( interest rate)
- P (inflation rate)
- E ( exchange rate)

The empirical result indicated an R2 test which is about 0.991 meaning that about 99.1 % of all variation of the money demand is explained by the model and the remaining 0.90 % of the variance is explained by other variables not included in this study.

The empirical result of the paper show that

- Ethiopia has registered remarkable economic performance with annual growth averaging 10.9% over the past ten years. This is double the Sub Saharan Africa and triples the world average growths over this period and has led to Ethiopia being rated as one of the fastest growing economies in the world.

The empirical result points out there is strong relationship between GDP and broad money demand (the correlation value is above 0.995) and the coefficient indicates that a one unit change in the GDP will cause a 0.783 unit change in the money demand to the same direction since they have a positive correlation.

- Interest rate is relevant in the demand for money since it is defined as the price that has to be paid for the use of money. The money supply and money demand could come to

equilibrium through the interest rate. It's also a monetary phenomenon determined by monetary force, since the interest rate is the way to control the money stock in the banking system that how much to lend and to invest in the economy.

- The empirical evidence for this is that the interest rate and money demand has a negative relation (-0.425 correlation value) and according to the coefficients a one unit change in interest rate will cause a 0.111 unit change in the money demand. This thing happened because of the consumer reaction to the price of a thing.

- Historically Ethiopia has been one of the low inflation economies with average inflation rate of less than 5 %. Since 2006 however Ethiopia has no longer been considered a low inflation country. The major causes were the then high fuel and food prices shocks, weaker foreign exchange earnings, and rising demand for imports that depleted international reserves of the country. The highest price increase was observed in food, housing, fuel and transport services, making the urban poor the most vulnerable to the impacts of inflation.

- In Ethiopia inflation rate and interest rate is found to be somehow less effective in changing the money demand. This is so because the majority of the people of Ethiopia live in rural area of the country and this means the people have no idea about the inflation rate and interest rate and are far from formal financial institutions.

- The exchange rate (Birr against US dollar) continued to slowly depreciate while there was a slight decline in international reserves of the country. The National Bank of Ethiopia (central bank), follows a managed floating exchange rate regime where the local currency Birr is pegged to the US Dollar.

- The empirical result points out there is a positive relation between exchange rate and the demand for money (correlation of 0.971) will cause a significant change in the dependent variable. And the coefficient indicates that a one unit change in the exchange rate will cause a 0.120 unit change in the money demand to the same direction since they have a positive correlation. i.e. from the international market perspective , this exchange

rate increment would lead the domestic product to get cheap in the international market . So purchasing power parity will be varied, that means small amount of dollar needed to buy a basket of good and service which have higher price in the domestic market.

## **4.2 Recommendation**

The major concern of this paper is identification of major determinants of the broad money demand function in Ethiopia. These variables are GDP (gross domestic product, I (interest rate), P (inflation rate) and E (exchange rate).

From the inflation point of view the people response towards the change in the inflation rate is weak just because of the absence of knowledge on key economic variables. In addition, even if people are aware of such a change, there is high information barrier and therefore it is advisable for the government to avail all the necessary information and increase people's awareness.

In relation to interest rate the Ethiopian government and the policy makers should plan a frame work that helps to reduce the money supply in the economy. It could be done through increasing the reserve requirement or just by making the interest rate higher to reduce the demand for real money balance and this will create shortage of money in the economy and in turn decrease the inflation rate.

Since our country's financial sector is weak the government should use both the monetary policy and the fiscal policy to affect the performance of the economy in general and the financial sector in particular. As the financial sector becomes stronger the monetary policy could be used to address the economy effectively.

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## Appendix

### Appendix A

	Narrow Money Supply (In Million of Birr)	Quasi-Money (In Million of Birr)	Broad Money Supply (In Million of Birr)
1994/1995	9922.4	4486.1	14408.5
1995/1996	9917.4	5737.4	15654.8
1996/1997	10024	6524.8	16548.8
1997/1998	11005.7	7549.2	18554.9
1998/1999	11378.9	8020.4	19399.3
1999/2000	13050	9127.8	22177.8
2000/2001	13745.8	10770.4	24516.2
2001/2002	15182.4	12139.6	27322
2002/2003	15416.8	13643.4	29060.2
2003/2004	18036	15590	33626
2004/2005	21291.1	18920.6	40211.7
2005/2006	23811.9	22565.5	46377.4
2006/2007	29617.68	27034.21	56651.89
2007/2008	35350.36	32831.78	68182.14
2008/2009	42112.66	40397.09	82509.75
2009/2010	52434.63	51997.77	104432.4
2010/2011	76171	69206	145377
2011/2012	94849.9	94548.9	189398.8
2012/2013	114745.7	120567.9	235313.6
2013/2014	134049.2	163682.8	297732

Source (annual report of national bank of Ethiopia)

Table 6 money supply from the year 1994/95-2013/14)

## Appendix B

	GDP at Current Market Price (In Million of. Birr)	Nominal GDP Growth Rate (In %)	Real GDP Growth Rate (In %)
1994/1995	28328.9	-	-
1995/1996	33885	-	-
1996/1997	37937.6	-	-
1997/1998	41465.1	-	-
1998/1999	58788.6	5.9	5.5
1999/2000	65,986.00	9	3.4
2000/2001	67,351.00	2.1	7.4
2001/2002	65,895.00	-2.2	1.6
2002/2003	72,703.00	10.3	-2.1
2003/2004	85,800.00	18	11.7
2004/2005	105,415.00	22.9	12.6
2005/2006	130,334.00	23.6	11.5
2006/2007	170,281.00	30.6	11.8
2007/2008	245,836.00	44.4	11.2
2008/2009	332,060.00	35.1	10
2009/2010	379,135.00	14.2	10.6
2010/2011	515,078.50	35.9	11.4
2011/2012	747,326.50	45.1	8.7
2012/2013	864,673.20	15.7	9.8
2013/2014	1,047,392.80	21.13	10.3

Source: Ministries of finance and economic development (MOFED), central Statistical authority(CSA) , national bank of Ethiopia(NBE) (macro economic and social indicator).

Table 7: GDP from the year 1994/95-2013/14)

## Appendix C

Year	Nominal deposit Interest rate	Rate %	Nominal lending Interest rate	Rate %
1994/1995	10.25	0.1025	14.58	0.1458
1995/1996	10.08	0.1008	15.08	0.1508
1996/1997	10.5	0.105	15.5	0.155
1997/1998	7.75	0.0775	11.6	0.116
1998/1999	6	0.06	11.75	0.1175
1999/2000	6	0.06	12	0.12
2000/2001	6	0.06	12.75	0.1275
2001/2002	3.08	0.0308	10.75	0.1075
2002/2003	3.08	0.0308	10.5	0.105
2003/2004	3.08	0.0308	10.5	0.105
2004/2005	3.08	0.0308	10.5	0.105
2005/2006	3.08	0.0308	10.5	0.105
2006/2007	3.08	0.0308	10.5	0.105
2007/2008	4.08	0.0408	11.5	0.115
2008/2009	4.5	0.045	12.25	0.1225
2009/2010	4.5	0.045	12.25	0.1225
2010/2011	5.38	0.0538	11.88	0.1188
2011/2012	5.38	0.0538	11.88	0.1188
2012/2013	5.38	0.0538	11.88	0.1188
2013/2014	5.38	0.0538	11.88	0.1188

Source (annual report of national bank of Ethiopia)

Table 8 Interest rate from the year 1994/95-2013/14)

## Appendix D

YEAR	ADDIS ABABA			COUNTRY LEVEL		
	food inflation	non food inflation	general inflation	food inflation	non food inflation	general inflation
1994/1995	16.8	2.6	13.4	-	-	4.6
1995/1996	2.3	5	0.9	-	-	12.5
1996/1997	-8.1	-3.9	-6.4	-	-	1.3
1997/1998	1.7	-0.1	1	1	3	3.9
1998/1999	-3.5	4.3	1.1	-2	9.9	4.3
1999/2000	7.2	0.6	4.2	7.6	2.5	5.4
2000/2001	-7.8	5.6	-1.4	-1.7	1.4	-0.3
2001/2002	-10.7	-0.8	-5.5	-19.1	0.3	-10.6
2002/2003	9.4	0.9	4.6	21.5	0.2	10.9
2003/2004	8.6	3	5.6	11.5	2.2	7.3
2004/2005	5.7	7.6	7.2	7.4	4.4	6.1
2005/2006	13	4.6	8.4	13	7.1	10.6
2006/2007	25.4	14	19.2	17.5	13.5	15.8
2007/2008	32.1	12.7	20.8	34.9	12.5	25.3
2008/2009	41.5	19.2	29.4	44.2	23.8	36.4
2009/2010	4.1	16	10.1	-5.4	18.2	2.8
2010/2011	14.8	23.5	19.4	15.7	21.8	18.1
2011/2012	30.6	21.1	24.8	22.5	42.9	34.1
2012/2013	13.1	11.9	12.6	14.5	12.6	13.5
2013/2014	4.6	11.4	8.5	5.9	10.6	8.1

Source: Ministries of finance and economic development (MOFED), central Statistical authority(CSA) , national bank of Ethiopia(NBE) (macro economic and social indicator).

Table 9: Inflation rate from the year 1994/95-2013/14)

## Appendix E

Exchange Rate ( Birr / USD )			
Inter-Bank Foreign exchange Market Rate			
YEAR	Period weighted Average	End period	Parallel Market Rate
1994/1995	-	-	6.2505
1995/1996	-	-	6.3178
1996/1997	-	-	6.5007
1997/1998	-	-	6.8817
1998/1999	7.3	8.12	7.69
1999/2000	8.2	8.22	8.31
2000/2001	8.42	8.46	8.79
2001/2002	8.543	8.566	8.68
2002/2003	8.581	8.6	8.7091
2003/2004	8.635	8.63	8.6751
2004/2005	8.652	8.66	8.711
2005/2006	8.681	8.69	9.0258
2006/2007	8.794	9.03	8.957
2007/2008	9.244	9.61	9.5569
2008/2009	10.4205	11.3009	11.8102
2009/2010	12.8909	13.5321	13.6806
2010/2011	16.1178	16.8169	16.5292
2011/2012	17.2536	17.5503	17.9883
2012/2013	18.1947	18.5331	19.3022
2013/2014	19.0748	19.5771	19.8666

Source: Ministries of finance and economic development (MOFED), central Statistical authority(CSA) , national bank of Ethiopia(NBE) (macro economic and social indicator).

Table 10: exchange rate from the year 1994/95-2013/14)

Appendix F

year	LOG form of broad money	LOG form of GDP	LOG form of Exchange rate	Interest rate	inflation rate
1994/1995	4.1586	4.4522	0.7959	0.1025	0.046
1995/1996	4.1946	4.53	0.8005	0.1008	0.125
1996/1997	4.2187	4.579	0.8129	0.105	0.013
1997/1998	4.2684	4.6176	0.8377	0.0775	0.039
1998/1999	4.2877	4.7693	0.8859	0.06	0.043
1999/2000	4.3459	4.8194	0.9196	0.06	0.054
2000/2001	4.3494	4.8283	0.9439	0.06	-0.003
2001/2002	4.4365	4.8188	0.9385	0.0308	-0.106
2002/2003	4.4632	4.8615	0.9399	0.0308	0.109
2003/2004	4.5266	4.9334	0.9383	0.0308	0.073
2004/2005	4.6043	5.0229	0.94006	0.0308	0.061
2005/2006	4.6663	5.115	0.9554	0.0308	0.106
2006/2007	4.7532	5.2311	0.9521	0.0308	0.158
2007/2008	4.8336	5.3906	0.9803	0.0408	0.253
2008/2009	4.9165	5.5212	1.0722	0.045	0.364
2009/2010	5.0188	5.5787	1.1361	0.045	0.028
2010/2011	5.1624	5.7118	1.2182	0.0538	0.181
2011/2012	5.2773	5.8735	1.2549	0.0538	0.341
2012/2013	5.3716	5.9368	1.2856	0.0538	0.135
2013/2014	5.376	6.0201	1.2981	0.0538	0.081

Table 11: computed value of the determinant in the model.