Chapter 7

Monetary System: Evaluation and Empirical Analysis

In the modern economy, monetary policy refers to the measures adopted by the central bank to influence the availability and price of money with a view to influencing the working of the economy. Johnson [1963] defines monetary policy as "policy employing central bank's control of the supply of money as an instrument for achieving the objectives of general economic policy". While Hart [1953] defines it as a policy "which influences the public's stock of money substitutes or the public's demand for such assets or both, that is, policy which influences the public's liquidity position".

The objectives of monetary policy differ from one country to another and from time to time within the same country, depending upon the nature of the problem confronting the economy. However, the principal objectives of monetary policy remain the same.

Generally, monetary policy is adjunct of economic policy. As such the objectives of the Eritrean monetary policy are not different from the overall objectives of the economic policy of the country. The Government of Eritrea [1994] indicated its objectives in the area of monetary policy as:

1. Stimulation of economic growth
2. Optimum accumulation and allocation of financial resources
3. Price stability
4. Inflation control
5. Securing favorable balance of payments position

To what extent has Eritrea been able to achieve these objectives of monetary policy? How effective have the various policy measures been in the working of the Eritrean monetary system? How stable are the demand for and supply of money functions in Eritrea?

These are some of the pertinent questions, which arise when one deals with the study of monetary system of a country. This chapter is an attempt to look for the answers to these questions related to Eritrea. This chapter has been divided into three sections. Section: 7.1 deals with an overall evaluation and analysis of various aspects of the monetary sector

such as the financial institutional structure, rates of interest, inflation, exchange rate and the supply of money with the purpose to examine their consistency under the framework of monetary policy objectives. Section: 7.2 empirically examines the stability of demand for money and supply of money functions in Eritrea. Section: 7.3 concludes the findings and draws the relevant policy inferences.

7.1 Evaluation of Eritrea's Monetary System

To analyze the working of the monetary system in the post-independent Eritrea, the discussion has been divided into five broad categories as given below. It is important to note here that the discussion is somewhat restricted due to the non-availability of some of the crucial data information.

a. *Financial Institutional Framework*
b. *Rates of Interest*
c. *Rate of Inflation*
d. *Foreign Exchange Rate*
e. *Aggregate Supply of Money*

a. Financial Institutional Framework

Financial institutions play a useful role in the development of the economies of the developing countries by mobilizing the small and scattered savings of the people and make them available for investment in productive enterprises. In this way, financial institutions can help in the formation of capital and its optimum utilization. Therefore, the foundation of a sound financial institution structure is an economic necessity that a developing country must seriously undertake.

Before independence the financial sector of Eritrea was functioning as branch networks of the Ethiopian financial system. After liberation the Ethiopian staff and managers were replaced by Eritreans and the entire sector underwent significant changes.

Currently, Eritrea's financial system consists of the Central Bank, one commercial bank and three development banks. The development banks are specialized banks, focusing on

general investment, housing and agriculture and industrial development respectively. In addition to these banks, Eritrea also has a financial institution specializing in insurance.

a.1 The Bank of Eritrea [BE] - the Central Bank of the country,
a.2 The Commercial Bank of Eritrea [CBE],
a.3 The Agricultural and Industrial Development Bank [AIDB],
a.4 The Housing and Commercial Bank of Eritrea [HCBE],
a.5 The Development and Investment Bank of Eritrea [DIBE],
a.6 The National Insurance Corporation of Eritrea [NICE].

Except for the HCBE, which is owned by the ruling party, all the other financial institutions are fully owned by the Government. A brief introduction of each one of these institutions is given below:

a.1 The Bank of Eritrea [BE]

Eritrea's central bank, the Bank of Eritrea [BE], was established in 1993. Prior to the introduction of the national currency, the Nak'fa, in November 1997, Eritrea was in a de facto currency union with Ethiopia – using the Ethiopian Bir as the legal tender. In March 1997, the BE proclamation was enacted. The Proclamation was intended to provide for an independent central bank, with extended powers to issue a legal tender and conduct monetary policy with a broad set of instruments, as well as to license, regulate and supervise financial institutions. The macro economic policy of the Government aims at transforming Eritrea into a center of finance and trade.

a.2 The Commercial Bank of Eritrea [CBE]

The CBE is the largest bank in the country and accounts for over 90 percent of the assets of the banking sector. It operates with over thirteen branches in different administrative regions of the country. Despite its small branch network, the performance of CBE as a domestic depository institution is remarkable. It operates over 163,000 saving accounts and 10,000 cheque accounts. The CBE is estimated to handle on an average 520 million Nak'fa in transaction every month. The activities of the CBE also cover the granting of long-term loans.

Like all Eritrean institutions, the CBE is chronically understaffed. It employs about 297 people [of whom 16 occupied management positions in the Commercial Bank of Ethiopia,

before Independence], compared to 331 employees under the Ethiopian colonization and with much less branches.

a.3 The Agricultural and Industrial Development Bank [AIDB]

Before independence, the AIDB was operating as a branch bank for the Ethiopian AIDB. After independence the AIDB was inherited by Eritrea. The AIDB is specialized in providing long-term lending to agriculture and industry. The major objectives of this bank are to help both the agricultural and industrial sectors by securing the necessary financial requirements and funds.

a.4 The Housing and Commercial Bank of Eritrea [HCBE]

The HCBE is owned by Eritrea's ruling party [People's Front for Democracy and Justice]. It was established to mobilize the small savings of the public and provide loans for individuals interested in building residential houses, or private and state-owned enterprises involved in the construction industry.

The HCBE has recently undergone a major restructuring to allow it to concentrate on commercial banking operations also, beside its role in real estate development projects.

a.5 The Development and Investment Bank of Eritrea [DIBE]

The DIBE is the last development bank to be established in Eritrea. It was established through a legal proclamation in October 1996 to fill the gap in the market by providing medium-and long-term loans with maturities of 5-7 years and 7-15 years. The DIBE meets the medium and long-term development credit demand of all the sectors of the economy. This would include both the agricultural and industrial sectors besides the infrastructure and services sectors.

The basic objectives of the DIBE are stated as:

- Promotion and acceleration of the country's development through the provision of development finance to viable development – oriented projects in all sectors of the economy in the form of credits, administered funds and equity investments.
- Provision of technical assistance to actual and potential clients.

- Mobilization of funds from national and international sources, whether private or public for facilitating the financing development oriented projects.

- Playing the role of a financial intermediary through which foreign development loans secured by the Government may be channeled to end users in the form of supervised development credits.

a.6 The National Insurance Corporation of Eritrea [NICE]

The National Insurance Corporation of Eritrea [NICE] is the only insurance corporation in the country. It was established shortly after liberation on the basis of a former branch of the Ethiopian insurance Corporation. The NICE engages in all classes of insurance with the exception to life insurance. It handles all types of insurance in the country namely: fire, motor, marine, workmen's compensation, public liability, burglary, aviation, personal accidents etc.

b. The Rates of Interest

In Eritrea, the government has granted the Bank of Eritrea [BE] the responsibility of fixing and monitoring the rates of interest until financial institutions and instruments are fully developed to enable the market forces to determine the interest rates. Through the interest rate policy, the BE aims at:

1. The growth of financial savings
2. Managing the movement of international capital
3. Controlling the growth of money supply
4. Controlling the directions of credit.

Interest rates continue to be administered by the BE, but they have been considerably streamlined. In 1994, a BE directive eliminated the differentiated lending rates between the public and private sectors, but interest differentials across economic sectors are still maintained.

b.1 Structure of Interest Rates

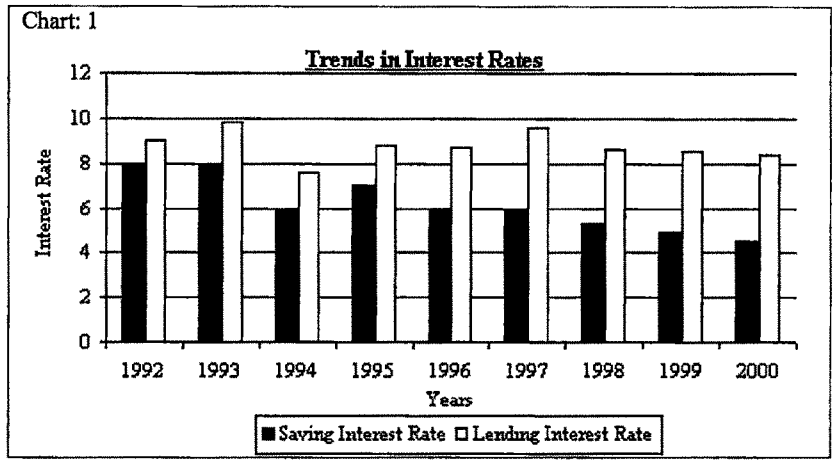
The interest rates in Eritrea may be broadly classified into two types: Saving rate of interest and Lending rate of interest:

The structure of the interest rates for the period 1992 to 2000 is given in Table: 1. The interest rates are generally given in ranges as per the maturity period. However, for the convenience of discussion, we have taken the average figures.

In the post-independence period, the interests rates on deposits have shown falling trends, down from 8 percent in 1992 to 4.5 percent in 2000. The average lending rate has almost remained stable with minor fluctuations. Consequently, the spread between saving and lending rates is widening in Eritrea.

Table: 1 Structure of Interest Rates
[average figures in percentages]

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Saving Rate	**8.0**	**8.0**	**6.0**	**7.0**	**6.0**	**6.0**	**5.3**	**4.9**	**4.5**
Lending Rates									
Agriculture	9.0	10.0	7.8	8.5	8.5	9.1	8.0	7.8	7.6
Industry	11.0	12.0	8.5	8.5	8.5	10.8	8.5	8.1	7.6
Domestic Trade	11.0	12.5	9.0	12.0	12.0	12.0	10.9	10.8	10.7
Transp. & Commu.	11.0	11.0	8.5	8.5	8.5	10.5	9.5	9.5	9.4
Export Trade	10.0	10.0	8.0	8.5	8.0	9.5	8.9	8.8	8.8
Import Trade	11.0	12.0	9.0	12.0	10.5	12.0	11.0	11.0	10.9
Hotel & Tourism	10.0	12.5	9.0	9.5	9.0	10.5	10.0	10.0	10.0
Personal Loans	7.5	7.5	8.5	10.0	10.0	12.0	9.3	9.3	9.3
Housing	9.3	10.8	7.5	10.3	12.0	9.8	10.0	10.0	10.0
Average Lending Rate	**9.0**	**9.8**	**7.6**	**8.8**	**8.7**	**9.6**	**8.6**	**8.5**	**8.4**



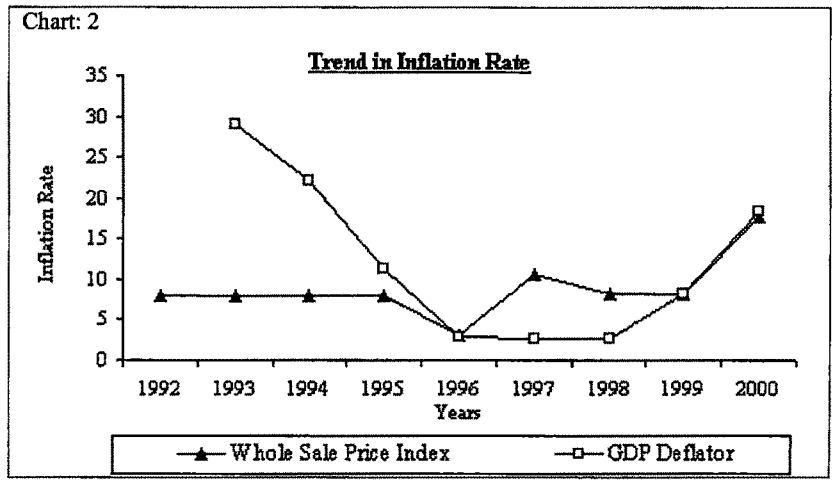
c. Rate of Inflation

In Eritrea, there are two concepts of inflation used- Wholesale Price Index [WPI] and GDP Deflator. In the case of Wholesale Price Index [WPI], inflation has been very high. Except in 1996, throughout 1992 to 2000, the WPI inflation remained at 8 percent and above. It reached its alarming point of 17.7 percent in the year 2000.

As for the GDP deflator inflation, it had been very high in the initial years of independence. It decreased from 29.1 percent in 1993 to as low as 2.7 percent in 1997, before rising to 8.2 percent in 1999 and further to 17.7 percent in the year 2000. The inflation rates for the period 1992 to 2000 are shown in Table: 2.

Table: 2 Inflation Rates

Years	1992	1993	1994	1995	1996	1997	1998	1999	2000
Wholesale Price Index	8	8	8	8	3	10.6	8.3	8.2	17.7
GDP Deflator	--	29.1	22.2	11.3	2.9	2.7	2.7	8.2	18.4



d. The Exchange Rate

Stabilization of exchange rates is among the main objectives of monetary policy, especially for countries, which are small in size and in whose economy foreign trade plays an important role. In spite of this, occasions are not rare, when the exchange rate itself is introduced as an instrument of monetary policy and used to achieve certain objectives. The determination of foreign exchange rate can either be left to the free market mechanism or deliberately be fixed by the government at a given exchange rate. When exchange rates are predominantly determined by the free market forces i.e. by supply and demand, without governmental interventions, they are known as flexible or floating exchange rates. When a government "pegs" its currency at a given exchange rate and then stands ready to defend it, that rate is known as a fixed exchange rate.

Changes in the rate of exchange can lead to a number of positive and negative effects in the economy. A country desiring to increase the volume of its exports or to protect its infant industries may adopt a competitive devaluation policy, [i.e. devaluation of currency to influence trade flows]. This policy makes imports more expensive in the domestic markets and exports more attractive to foreigners, thereby increasing exports and protecting infant industries simultaneously. The success of this policy in stemming the flow of imports and boosting exports highly depends, among other things, on the elasticity

of demand for exports and imports to change, in their price and the extent to which the devaluation is unilateral.

The negative effect such policy produces in the economy is that the changes in the rate of exchange rise to a lot of speculative activity in the foreign exchange market which stimulates the outflow of domestic capital and hinders the inflow of foreign capital and thereby leading the economy into a state of depression. Moreover, once the same weapon is adopted by the opponent countries, the competitive devaluation policy will not only fail to achieve its objectives but also have an adverse effect on the domestic economy. The rise in the domestic price of imports also includes the prices of imported raw materials and components. This will raise the domestic production costs and bring the economy in a state of inflation.

Earlier, when Eritrea was using the Ethiopian Bir as its legal tender, the exchange rate of the Bir in Eritrea was determined through a weekly auction held by the National Bank of Ethiopia aiming at the achievement of the overall objectives of the Ethiopian economic policy. While in Eritrea, the exchange rate of the same Bir was set and managed with the objective of achieving the overall policy of the Eritrean economy.

The exchange rate of the Bir [the then currency of Eritrea] was managed in Eritrea with the objectives of encouraging:

1. Export oriented production,
2. Securing external markets for Eritrea's exports,
3. Attracting foreign investors, and
4. Controlling inflationary expansion of money supply.

After the introduction of the national currency "Nakfa" in 1997, Eritrea adopted a managed float exchange rate system. Under this system, the role of the Bank of Eritrea is regulatory in a sense that all banks and foreign exchange bureaus are free to set their own exchange rates. However, Bank of Eritrea reserves its right to intervene from time to time to regulate the adverse foreign exchange rate fluctuations.

e. The Aggregate Supply of Money

The aggregate supply of money refers to the total amount of money that exists at any one time in the economy. Because it is impossible to define precisely what money is in

practice, various definitions of the money supply are used in monetary economy and in government statistics. All these definitions start with the bank notes and coins that are in circulation in the economy. However, since goods and services may also be paid for by cheques, the total value of all current bank accounts is also generally included in the definition of money supply. Moreover, certain kinds of bank deposit accounts and overdraft facilities can be drawn on at will, therefore this also constitute part of the definition [Daintith, 1983].

In many countries, governments have the ability to increase the money supply by simply ordering their central bank. They usually do so to finance a deficit budget or to achieve certain economic goals. When the supply of money is allowed to rise, people and firms possess more money to spend and interest rates in general tend to fall, as a result both consumption and investment rise. Consequently, increased consumer and investment spending increase the aggregate demand in the economy and thereby, affecting production, employment and inflation.

In Eritrea, the definitions of money stock used are:

1. Narrow Money [M1]: This is the narrowest definition; including all the notes and coins in circulation [C] and demand deposits [DD].

   $$\textit{Narrow Money [M1]} = C + DD$$

2. Broad Money [M3]: This is a broader definition of money. In addition to M1, it also includes time deposits [TD].

   $$\textit{Broad Money [M3]} = C + DD + TD$$

Before introducing its independent national currency "Nak'fa" on November 8, 1997, Eritrea was forming a de-facto currency union with Ethiopia, and provisionally using the Ethiopian Bir as its legal tender. In spite of the de-facto currency union, both the countries were adopting different monetary systems and policies. However, in the absence of any formal mechanism that harmonize the monetary systems and policies of both the countries, the de-facto currency union could not realize the economic and political aspirations of both the governments. Moreover, in addition to the economic complications, the failure of the de-facto currency union created critical political problems and differences between both the governments, which led into direct confrontations.

Prior to the introduction of the Nak'fa, there were no reliable estimates of currency outside banks. Therefore, figures for currency in circulation for the years 1992 to 1997 have been estimated on the basis of the proportional growth of the Ethiopian currency "Bir" which Eritrea was using during that period.

e.1 Trend and Composition of Money Supply

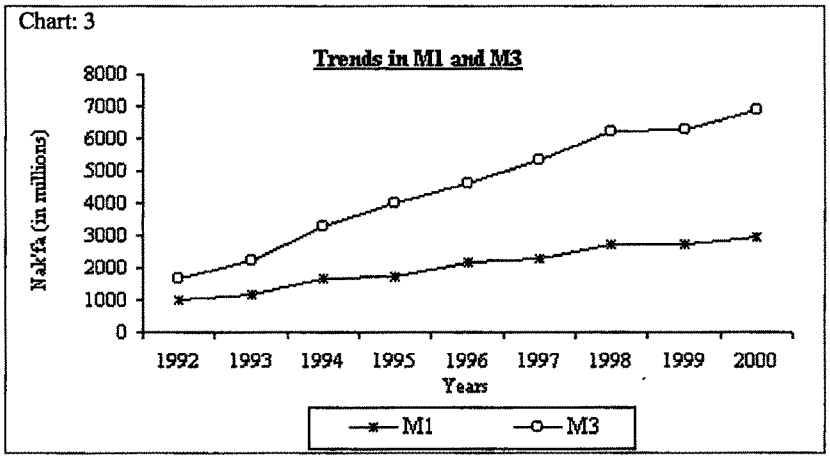
Table 3, 4 and 5 show the composition, growth of money supply as a percent of GDP and annual growth rates for narrow as well as broad money stock in Eritrea respectively. All the figures are in nominal terms.

Table: 3 Money Supply: In millions of Nak'fa

Years	Currency in Circulation ***C*** [1]	Demand Deposits ***DD*** [2]	Time Deposits ***TD*** [3]	Total Deposits ***TOTD*** [4 = 2 + 3]	Narrow Money ***M1*** [5 = 1 + 2]	Broad Money ***M3*** [6 = 1 + 4]
1992	297.1	722.6	669.5	1392.1	1019.7	1689.2
1993	306.9	866.8	1058.5	1925.3	1173.7	2232.2
1994	410.6	1258.4	1630.9	2889.3	1669.0	3299.9
1995	450.0	1295.8	2273.5	3569.3	1745.8	4019.3
1996	489.4	1677.0	2434.8	4111.8	2166.4	4601.2
1997	575.4	1703.3	3048.2	4751.5	2278.7	5326.9
1998	827.0	1881.5	3527.8	5409.2	2708.5	6236.2
1999	794.5	2021.5	3643.1	5567.2	2714.6	6293.0
2000	873.3	2190.9	4030.9	6100.1	2937.5	6887.5

Table: 4	Money Supply: As Percentage of GDP					
Years	Currency in Circulation ***C*** [1]	Demand Deposits ***DD*** [2]	Time Deposits ***TD*** [3]	Total Deposits ***TOTD*** [4 = 2 + 3]	Narrow Money ***M1*** [5 = 1 + 2]	Broad Money ***M3*** [6 = 1 + 4]
1992	14.8	36.1	33.5	69.6	51.0	84.4
1993	12.1	34.3	41.9	76.2	46.4	88.3
1994	12.1	37.1	48.1	85.3	49.3	97.4
1995	12.3	35.4	62.2	97.6	47.8	110.0
1996	12.0	41.0	59.6	100.6	53.0	112.6
1997	12.9	38.1	68.2	106.3	51.0	119.2
1998	16.7	38.0	71.2	109.2	54.7	125.9
1999	14.5	36.8	66.3	101.3	49.4	114.5
2000	14.3	35.9	66.0	99.9	48.1	112.8
Average	**13.5**	**37.0**	**57.4**	**94.0**	**50.1**	**107.2**

Chart: 3



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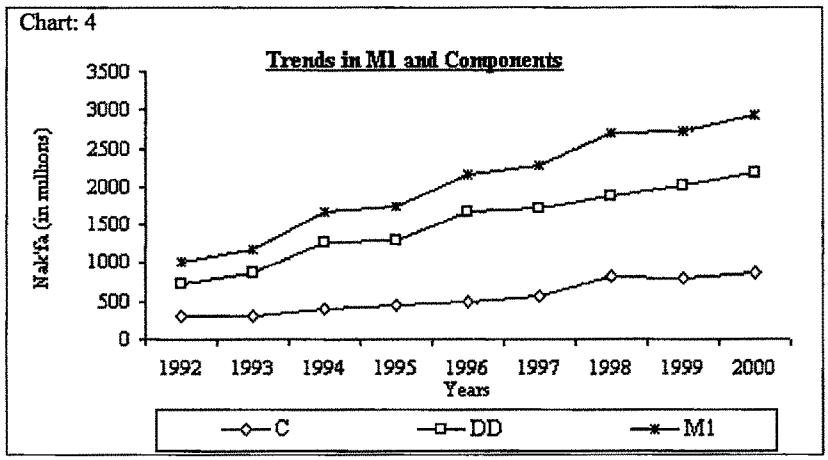

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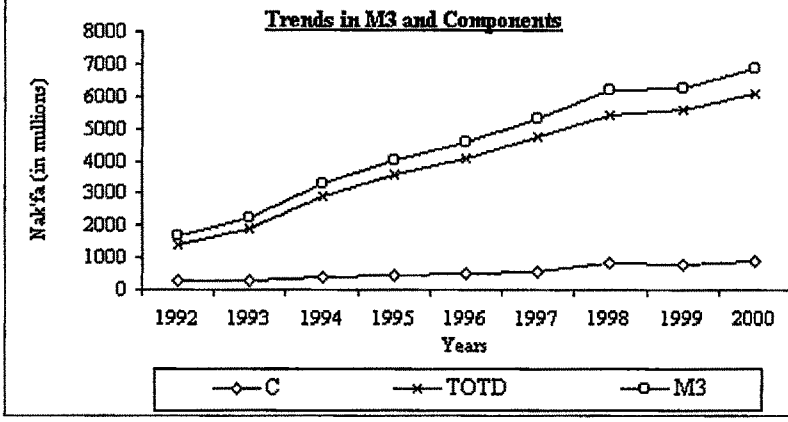

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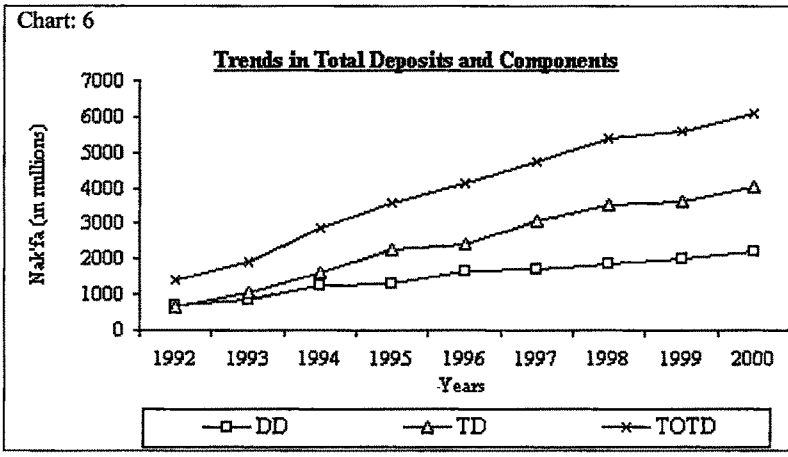

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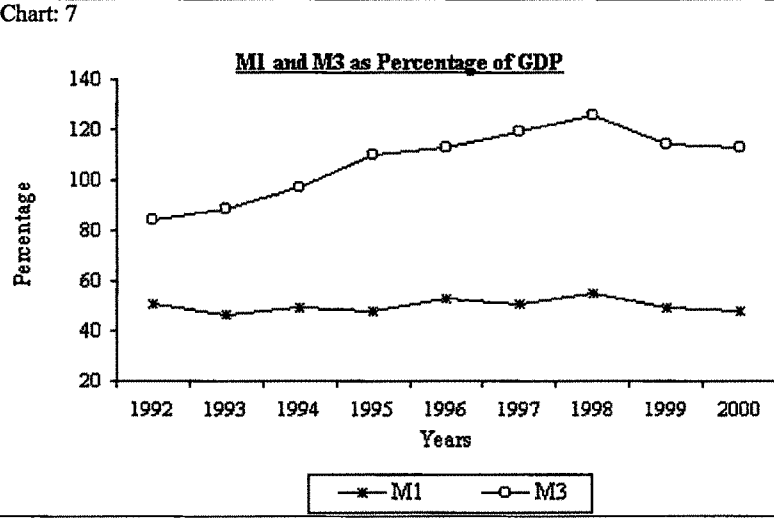
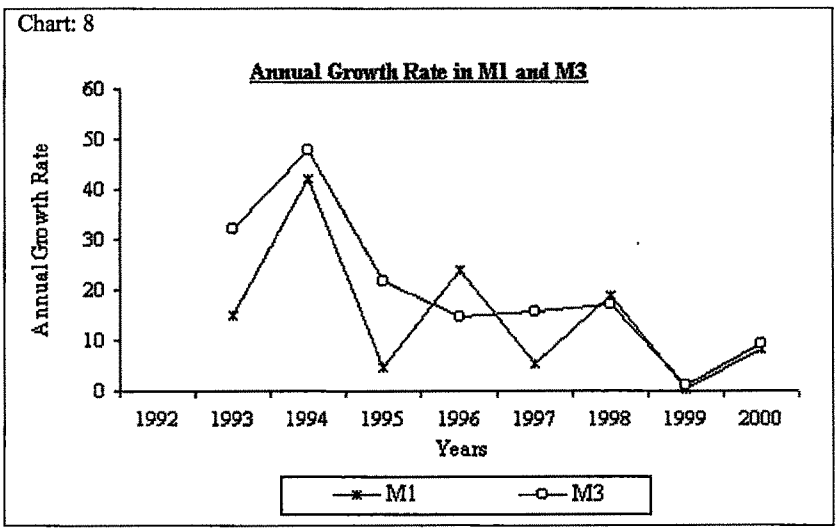


Table: 5 Money Supply: Annual Growth Rate [in %]

Years	Currency in Circulation ***C*** [1]	Demand Deposits ***DD*** [2]	Time Deposits ***TD*** [3]	Total Deposits ***TOTD*** [4 = 2 + 3]	Narrow Money ***M1*** [5 = 1 + 2]	Broad Money ***M3*** [6 = 1 + 4]
1992	--	--	--	--	--	--
1993	3.3	20.0	58.1	38.3	15.1	32.1
1994	33.8	45.2	54.1	50.1	42.2	47.8
1995	9.6	3.0	39.4	23.5	4.6	21.8
1996	8.8	29.4	7.1	15.2	24.1	14.5
1997	17.6	1.6	25.2	15.6	5.2	15.8
1998	43.7	10.5	15.7	13.8	18.9	17.1
1999	-3.9	7.4	3.3	2.9	0.2	0.9
2000	9.9	8.4	10.6	9.6	8.2	9.4
Average	**15.3**	**15.7**	**26.7**	**21.1**	**14.8**	**19.9**

Chart: 8



7.2 Empirical Analysis of Eritrea's Monetary System

There are three most important behavioral issues, which influence the working of the monetary system in a country. These are: demand for money, velocity of money and the determination of money multiplier. The importance of these monetary issues lies not only because of their influence on the overall working of the monetary system but also because these factors are not fully under the command of the monetary authorities. These factors themselves are determined largely by the behavior of the public.

In this section, we empirically examine these important issues related to the Eritrean monetary system.

As Jadhav [1994] points out - the inter-relationship between money, output and prices constitutes a fundamental element in most macroeconomic theories. This relationship between money, output and prices, which lies at the heart of the monetary planning, is explained in the form of demand for money. Part [a] of this section deals with the issues and estimation of demand for money in Eritrea.

The relationship between money, output and prices is the cynosure of monetary theory and policy alike. Analytically, what lies at the heart of this relationship is the velocity of money. Part [b] of this study analyses the velocity of money in Eritrea. To complete the empirical analysis on Eritrea's monetary system, Part [c] of this study deals with the money multiplier approach to the determination money supply in Eritrea.

a. Demand for Money

The demand for money is a crucial factor which affects and determines the level of aggregate economic activity in an economy. A stable demand function for money has been recognized as an essential prerequisite for any meaningful conduct of monetary policy and hence, the importance and interest in the research on the subject. A proper understanding and estimation of the demand for money equation is essential for the critical evaluation of past monetary policies and also for the formulation of future policies.

There are a large number of empirical studies conducted in developed and developing countries on the demand for money function over a period of time. There are quite a few

excellent studies, which have surveyed the empirical research carried out on this subject. To name some: Gujarati [1968], Sampath and Hussain [1975], Boorman [1976], Fiege and Pearce [1977], Sharma [1978] and Judd and Scadding [1982]. In the context of Indian studies, pioneer work by Jadhav needs special mention. Jadhav's article [Jadhav, 1990] and book [Jadhav, 1994] vastly review the empirical literature on Indian monetary system in the context of international work. There has not been found any empirical work on Eritrean monetary system and the present work derives, to some extent, its interpretations from these pioneer works on monetary economics.

In the most traditional form, the demand for money has the following function.

$$\mathbf{M = f\ [Y,\ R,\ P]}$$

Where M is money stock, Y is a size variable measuring the size of the economy, R is the rate of interest and P is the price level.

The inclusion of scale variable is in accordance with the transaction theories of money which viewed money essentially as an inventory held for transaction purposes. Interest rate is incorporated as a measure of the opportunity cost of holding money in conformity with the asset theories of money demand, which construed the demand for money as a problem of portfolio choice [Jadhav, 1994].

a.1 The Issues

Based upon the above-mentioned studies, the major conclusion that can be made is that there seems to be no consensus reached on the issues involved in the estimation of demand for money in an economy. Different studies have used different methodologies, data interpretations and time-periods [Sampath and Hussain, 1975]. Let us discuss some of these issues.

i. Money [M]

- How should the money be defined?
- Should it be narrow money or broad money?

ii. Scale Variable [Y]

- What should be the appropriate scale [Y] variable?

- Should it be income or wealth?
- If income, as has been most widely used, then which income- GDP, GNP or NI?
- Should it be current income [Keynesian] or permanent income [Friedman]?

iii. Interest Variable

- Is rate of interest an important determinant of demand for money as suggested by Keynes but rejected by Friedman?
- There are many types of rates of interest. Which one is the most appropriate?

iv. Estimation

- For a stable demand function, should the data be monthly, quarterly or yearly?
- The variables should be in nominal or real terms?
- What should be the functional form? Should it be linear, log-linear or double-log?

The present study makes an attempt to estimate the demand for money function in Eritrea, considering all the important issues raised here within the limits of the availability of data.

a.2 Methodology and Data Specification

As pointed out earlier, the study of demand for money refers to the examination of the inter-relationship between money, output and prices.

i.e. $\mathbf{M = f\ [Y,\ R,\ P]}$

Accordingly, the estimable model used in the present study is:

$$\boldsymbol{\log M = a + b \log Y + c\ R + d\ P}$$

where,

M = Money Stock [defined alternatively as narrow and broad money]
Y = Income Level [defined as GDP]
R = Rate of Return [defined as deposit rate of interest]
P = Price Level [defined as WPI inflation]

The above demand for money equation has been estimated for two measures of money stock- narrow money [M1] and broad money [M3] and also; for the components of money stock- currency held by public [C], demand deposits [DD] and time deposits [TD].

It is hypothesized here that income [Y] is positively related to the demand for money whereas the rate of interest [R] and price level [P] are negatively related to the demand for money.

The time period taken for the study is 1992-2000. The ordinary Least Square [OLS] method of regression analysis has been used for the estimation of all the specified demand for money equations.

a.3 Estimated Results

The demand for money equations were estimated using real as well as nominal values of the money stock and its determinants. The estimated equations with real values of the variables turned out to be statistically very insignificant. Hence, the estimated equations in nominal values have only been considered and presented here.

Table: 6 Estimated Demand for Money Equations

Equation No.	Dependent Variable [log]	Intercept	Co-efficients of Independent Variables and *[t-values]*			R2	Adj R2	F
			Log Y	***R***	***P***			
1	***M1***	0.184 *[0.26]*	0.908 *[5.71]*	-0.020 *[-1.02]*	-0.003 *[-1.52]*	0.988	0.981	146.344
2	***M3***	-2.149 *[-2.67]*	1.571 *[8.46]*	0.025 *[1.101]*	-0.003 *[-1.47]*	0.990	0.985	181.075
3	***C***	0.204 *[0.11]*	0.760 *[1.83]*	-0.039 *[-0.75]*	0.002 *[0.49]*	0.935	0.896	24.185
4	***DD***	-0.134 *[-0.24]*	0.958 *[7.63]*	-0.017 *[-1.12]*	-0.004 *[-2.46]*	0.993	0.989	243.965
5	***TD***	-5.151 [-5.56]	2.254 *[10.53]*	0.071 *[2.64]*	-0.004 *[-1.52]*	0.992	0.987	213.999

The estimated demand for money equations with respect to narrow money [M1] and broad money [M3], and also the components of money stocks are given in the table below. All the five estimated equations are statistically quite significant. All the co-efficients in all the equations have given '*a priori*' signs. Most of the co-efficients are statistically significant

at percent level of significance. Overall explanatory power, as measured by adjusted R2 is above 0.9 in all the equations.

Inferences:

Based upon the estimated results, as given in the table above, the following inferences can be made:

1. Income Elasticities of Demand for Money

i. The income elasticity of demand for narrow money [0.908] is close to unitary, implying the proportionate change in income and demand for narrow money in Eritrea.

ii Income elasticity of demand for broad money is quite high at 1.571, meaning thereby that the demand for broad money in Eritrea is sensitive to the economic growth as measured by GDP.

iii. The income elasticity of demand for time deposits is very high at 2.54 compared to the other components of money stock- currency [0.76] and demand deposits [0.958].

2. Interest Rates

i. Rate of interest [R] as an explanatory variable is not listed as significantly as in the other explanatory variables, except in the case of total deposits {TD].

ii. The values of the co-efficients of rate of interest refer to the semi-elasticities of interest in a log linear form of equation, as used in here. These elasticities have very low values in our estimations [0.07 and below], indicating that the demand for money is interest inelastic.

iii. The above two findings support Friedman's argument in the case of Eritrea. Friedman argues that the rate of interest is not an important determinant of demand for money as suggested by Keynes.

3. Price Level

i. Price level [inflation] as a determinant of demand for money is significantly listed in all the equations except currency.

ii. The semi-elasticity of price, like interest, is very low [0.04 and below] in all the demand for money equations, implying that the demand for money is price insensitive.

b. Velocity of Money

Monetary authorities all over the world strives to control the money supply not for its own sake, but for regulating the flow of spending in economy with a view to containing inflationary pressures. The flow of spending, however, depends upon not only on the total stock of money but also on its rate of turnover- the velocity of money. Velocity of money does not come under the direct control of the monetary authorities. Any given stock of money might be spent faster or more slowly, i.e. velocity of money might rise or fall. Accordingly, a wide range of potential spending levels could conceivably flow from the same stock of money [Jadhav, 1994]. An expansionary monetary policy may be neutralized by a falling velocity of money. And that is a dilemma various monetary authorities have been facing the world over.

Growing monetization of the economy and the increasing commercial banking network in a country are the important factors which lead to declining trend in the velocity of money. The rising velocity of money is due to the financial innovations and sophistication taking place in a country.

Here, in this study, we examine the determinants and movements of velocity of money in Eritrea. First, we have examined the behavior of velocity of money in Eritrea in the post-independent era. Then after, we have specified and estimated the velocity of money function.

b.1 Behavior of Velocity of Money in Eritrea

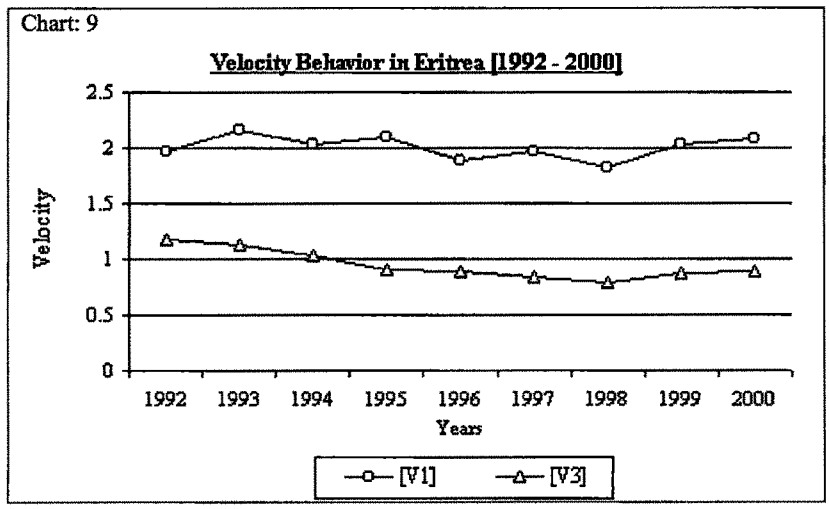
The velocity of money [V] is defined as the ratio of nominal income to the stock of money [M]. Nominal income refers to the current GDP at factor cost. As Eritrea uses two measures of money stock- narrow money stock [M1] and broad money stock [M3], we define the velocity of money with respect to both these measures.

V1 = Velocity of narrow money [Y/M1]
V3 = Velocity of broad money [Y/M3]

The table below displays the yearly movement/variation in the velocity of money [V1 and V3] over a period from 1992 to 2000.

Table: 7 Velocity of Money Behavior in Eritrea		
Year	Velocity of Narrow Money [V1]	Velocity of Broad Money] [V3]
1992	1.962	1.184
1993	2.154	1.132
1994	2.030	1.027
1995	2.094	0.909
1996	1.887	0.888
1997	1.961	0.839
1998	1.829	0.794
1999	2.025	0.873
2000	2.078	0.886
Minimum	1.829	0.794
Maximum	2.154	1.184
Average	**2.002**	**0.948**
Standard Deviation	0.103	0.135
Volatility*	**0.051**	**0.142**

*volatility is defined as standard deviation/average ratio.



Inferences:

The following inferences can be made from the results in the table above:

i. The velocity of narrow money is more stable, moving around in the range of 1.829 to 2.154, compared to the velocity of broad money which has shown much wider variation in the range of 0.794 to 1.118.

ii. The velocity of narrow money is, on an average, twice the velocity of broad money.

iii. The tight monetary policy aimed at controlling inflationary pressures would fail to achieve its objective if the contractionary monetary policy instrument is neutralized by a simultaneous rise in the velocity of money. This monetary puzzle [the trade-off] is not applicable in the case of Eritrea as the velocity of money, in particular the V1, has been quite stable in that country.

iv. According to Bordo and Jonung [1987] and Jadhav [1994], the velocity of money generally follows a U-shaped pattern, with an initially declining segment, an intermediate flat segment, followed finally by a rising segment. This long-run behavior is influenced by the institutional factors the monetization process which is dominant in the early stage of development, is deemed to be responsible for the declining segment, whereas financial sophistication achieved as the economy matures is said to be instrumental in bringing about the rising segment.

The behavior of velocity of money in the low-income countries confirms to the declining segment while that of the high-income countries corresponds to the rising segment. For the middle-income countries, velocity of money is rising while that of broad money is following.

A careful study of the velocity graphs above indicate a flat but very marginally declining trend in velocity of broad money. This finding is in confirmation with the Bordo and Jonung [1987] study suggesting that Eritrea is in an early stage of monetary development and falls in the category of low-income country.

b.2 Determinants of Velocity of Money in Eritrea

In the theory and also in the vast empirical literature on the subject, the velocity of money is assumed to be a function of conventional factors such as income and interest rate and recently identified institutional factors. Some of the often quoted studies that have included and/or identified the institutional factors in the velocity of money function are: Gurlay and Shaw [1960], Smith [1960], Tobin [1965], Friedman and Schwartz [1982], Bordo and Jonung [1987] and Jadhav [1994]. The institutional factors identified in these studies are spread of commercial banking, growing monetization of the economy and financial innovations.

Due to the lack of proper data on the institutional factors, the variables on this important factor can not be included in this study. Hence, this study adopts the conventional function to estimate the velocity of money in Eritrea. An additional variable, the lag of dependent variable, Vt-1 has also been included in the equation as a determinant of velocity of money. The reasons for including this variable are two folds. First, it is hypothesized here that the past behavior of the velocity of money does have its influence on current behavior. Second, the inclusion of the lag of dependent variable gives us the long term elasticity with respect to the independent variables.

The velocity of money function estimated in this study is:

$$\log V = a + b \log Y + cR + d\ Vt\text{-}1$$

The above equation has been estimated for both narrow [V1] as well as broad money [V3], using the data for years 1992 to 2000. Both, the real as well as the nominal values of the variables have been used in the estimation of the velocity of money equations.

b.3 Estimated Results

The estimated results on the above velocity equation for both, V1 and V3, turned out to be statistically very poor in real values of the variables. After trying alternative combinations also, the results still remained in the unaccepted range. Furthermore, the estimated results with nominal values of the variables also turned out to be statistically insignificant in the case of velocity of narrow money [V1].

The regression results with nominal values of the variables in the above equation turned out to be statistically quite significant for velocity of broad money [V3]. Alternative combinations of the independent variables were tried in the estimation procedures, as given in Table: 8 below.

Table: 8 Estimated Velocity of Money Equations Dependent Variable: ***log V3*** [Velocity of Broad Money]							
Equation No.	Intercept	Co-efficients of Independent Variables and *[t-values]*			R2	Adj R2	F
		Log Y	**R**	**V3 $_{t-1}$**			
1	0.790 [0.46]	-0.196 *[-0.46]*	-0.017 *[-0.53]*	0.596 *[1.28]*	0.807	0.662	5.588
2	2.150 [2.44]	-0.556 *[-2.74]*	-0.028 *[-1.13]*		0.833	0.777	14.991
3	-0.019 [-0.027]	-0.0009 *[0.004]*		0.697 *[1.765]*	0.793	0.710	9.598
4	1.183 [5.12]	-0.337 *[-5.24]*			0.797	0.768	27.517
5	-0.258 [-3.73]		0.037 *[3.40]*		0.623	0.569	11.602
6	-0.022 [-2.47]			0.699 *[4.79]*	0.793	0.758	23.035

Inferences:

Out of the six estimated velocity of broad money equations, involving alternative combinations of explanatory variables, the equation no. 2 has given relatively better statistical results. Accordingly, the equation no. 2 has been selected for further analysis and policy inferences. This equation lists income [Y] and Rate of interest [R] as the determinants of velocity of money in Eritrea.

The following inferences can be drawn from the above analysis:

i. The income elasticity of money velocity is negative and less than one throughout, implying that an increase in income as measured in GDP reduces the velocity of broad money, however less than proportionately. This finding further emphasizes that the economic growth suppresses the velocity of money in Eritrea.

ii. The interest elasticity of money velocity is also negative and very low in value [0.028]. This implies that velocity of broad money is interest inelastic.

iii. The lag dependent variable [V3 t-1] is listed significantly in all the equations wherever it has been included with almost the same values of the co-efficients. However, possibly due to the existence multi-collinearity and/or small data size, this variable weakens the significance level of the income variable [Y]. Nevertheless, an important inference which can be drawn from the significant listing of V3 t-1 is that the past behavior definitely influences the present behavior of velocity of broad money in Eritrea.

c. Determination of Money Supply

There are two approaches to the determination of money supply: the money multiplier approach and the balance-sheet or structural approach. The money multiplier approach relates the money supply to the reserve money. The balance-sheet approach deals with the individual items in the balance-sheet of the monetary sector in explaining the change in the money supply. This study adopts the money multiplier approach to the determination of money supply, as due to the lack of detailed central bank balance-sheet data, the later approach can not be used.

In the 1970s, the world-wide acceleration of inflation was the most important problem for which practical remedies needed to be immediately offered. The central banks of most major industrial countries had adopted monetary targeting strategies against the global inflationary trend. After the breakdown of fixed-rate system of Breton-Woods, a necessary scope for an autonomous monetary policy had been created. Provided that there is a long run relationship between the money stock and the prices, the monetary targeting is considered as the best strategy through which a central bank choose the money stock as nominal anchor to provide price stability [Gokbudak, 1995].

In order for the money stock to be targeted intermediately, the central bank should be able to control the money stock. This necessitates, in turn, the followings: First, the monetary authority must choose a monetary aggregate, which incorporates all the instruments it uses to implement the monetary policy. Second, the relationship between the monetary aggregate and the money supply; i.e., the money multiplier must be stable and predictable.

Provided that the monetary base [H] is under the control of the monetary authority, the determination of the reasons behind the changes in the money multiplier becomes important in the implementation of monetary policy. Given that H is under the control of the Central Bank, it could only achieve its primary objective of providing the price stability by controlling the money multiplier as much as possible.

The multiplier model of the money supply, originally developed by Brunner [1961] and Brunner and Meltzer [1964], has become the standard paradigm in macroeconomics and money and banking textbooks to explain how the policy actions influence the money stock. It has also been used in empirical analyses of money stock control and the impact of monetary policy actions on other economic variables. In monetarist analysis, the

interaction of the supply of money - or its inverse, the velocity of circulation of money, forms the basis of models of price and/or exchange rate determination. The multiplier model of the money supply argues that the control of the money supply relies on the authorities being able to control the base and to predict behavioral relations of the banks and the non-bank private sector [Ahinbeyoolu, 1995].

c.1 Money Multiplier Approach to the Determination of Money Supply

The supply of money [M] and nominal reserve money [H] are related through the money multiplier [m], as in the following equation:

$$m = m\,H$$

The equation explains that the money supply [M] is simply a multiple [m]of the reserve money [H]. In case the money multiplier is stable, the change in money supply would come from the changes in the reserve money.

$$M = M/H$$

Similarly,

$$\text{incremental } m \quad \frac{\text{change in M}}{\text{change in H}}$$

Money supply [M] is defined in two ways, as discussed earlier:

$$M1 = C + DD$$
$$M3 = C + DD + TD$$

Hence,

Narrow Money Multiplier [m1] = M1/H
Broad Money Multiplier [m3] = M3/H

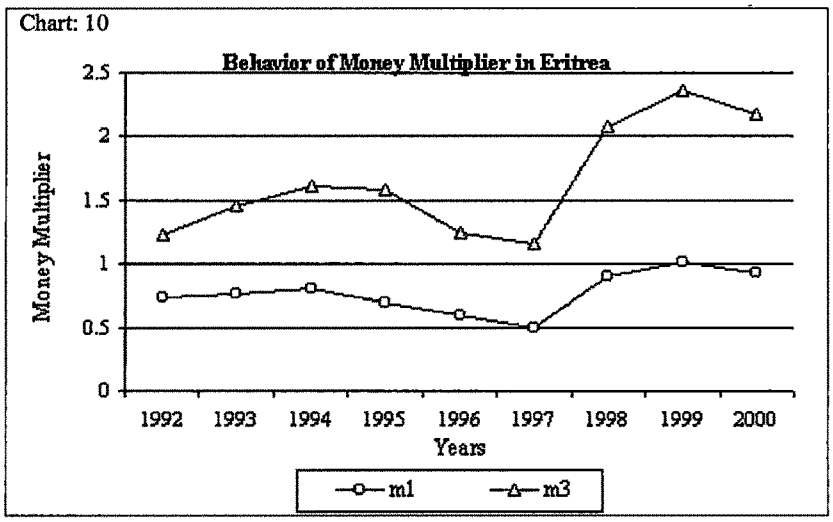
Where,

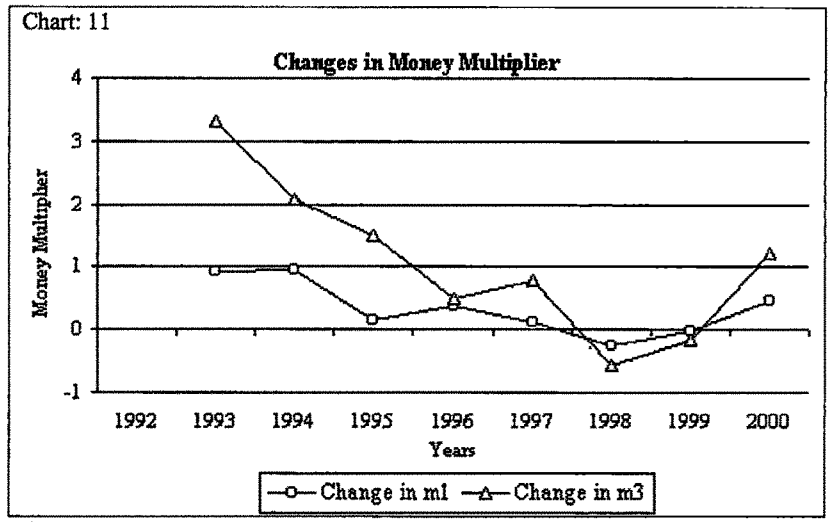
C = currency held by the public
DD = demand deposits with commercial banks
TD = time deposits with commercial banks
H = Reserve money on high powered money

b.2 Behavior of Money Multiplier in Eritrea

Money multiplier corresponding to narrow money [m1] and broad money [m3] in the post independent period of Eritrea are presented in the Table 9 below:

Table: 9	**Behavior of Money Multiplier in Eritrea**			
Year	Narrow Money Multiplier		Broad Money Multiplier	
	m1	Incremental m1	m3	Incremental m3
1992	0.741		1.227	
1993	0.761	0.936	1.448	3.302
1994	0.812	0.962	1.605	2.073
1995	0.689	0.161	1.586	1.505
1996	0.587	0.365	1.248	0.505
1997	0.493	0.120	1.152	0.774
1998	0.900	-0.266	2.073	-0.562
1999	1.014	-0.018	2.352	-0.171
2000	0.927	0.452	2.173	1.205
Minimum	0.493	-0.018	1.152	-0.171
Maximum	1.014	0.962	2.352	3.302
Average	**0.769**	**0.339**	**1.651**	**1.079**
Standard Deviation	0.166	0.436	0.445	1.242
Volatility	**0.216**	**1.286**	**0.269**	**1.151**





The following observations can be made from the above table:

i. The value of narrow money multiplier [m1] has varied from 0.493 to 1.014 in the post-independence period 1992 to 2000. The average value of m1 in the said period was 0.769.

ii. The value of broad money multiplier [m3] has moved from 1.152 to 2.352 during the post-independence period. The average value of m3 was 1.651 for the same period.

iii. The values of narrow as well as broad money multipliers have been quite stable, as indicated by the low volatility values at 0.216 and 0.269 respectively.

iv. The incremental values of m1 and m3 have shown falling but volatile behavior all throughout.

b.3 Sources of Money Multiplier

To find out the sources of changes in the money multiplier, let us now, find out the components of money multiplier. The equation for broad money multiplier can be written as follows:

$$m3 = \frac{1 + c + t}{c + r\,[1+t]}$$

or,

$$M = \frac{1 + c + t}{c + r\,[1+t]} \times H$$

where,

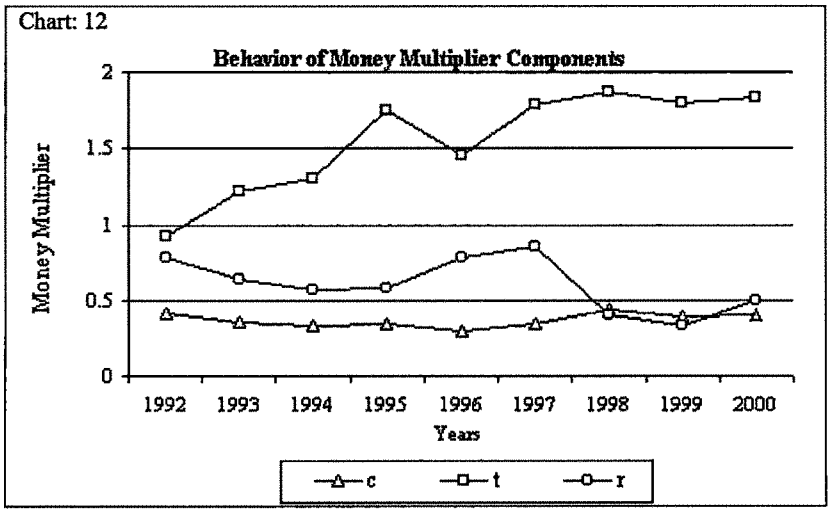
c = ratio of currency to demand deposits [C/DD]
t = ratio of time deposits to demand deposits [TD/DD]
r = ratio of bank reserves to total deposits [BR/TD+DD]

The Table 10 displays the variation in the components of money multiplier over a period of 1992 to 2000.

Table: 10 Behavior of Money Multiplier Components

Year	c	t	r
1992	0.411	0.927	0.776
1993	0.354	1.221	0.641
1994	0.326	1.296	0.570
1995	0.347	1.755	0.584
1996	0.292	1.452	0.778
1997	0.338	1.790	0.852
1998	0.440	1.875	0.403
1999	0.393	1.802	0.332
2000	0.399	1.840	0.495
Average	**0.367**	**1.551**	**0.603**
Minimum	0.292	0.927	0.332
Maximum	0.440	1.875	0.852
Standard Deviation	0.047	0.339	0.176
Volatility	**0.128**	**0.219**	**0.293**

Chart: 12



Inferences:

There are some important inferences, which can be derived from the above table. These are:

i. An increase in c-ratio [C/DD] brings a rise in money supply. It is so because an increase in c-ratio brings a shift from deposits to currency, and as deposits undergo multiple expansion while currency not, the net result is contraction of money multiplier and the stock of money.

   In the case of Eritrea, the c-ratio has almost remained stable with very low volatility. It indicates that the change in money supply in Eritrea is neutral to the c-ratio.

ii. The t-ratio [TD/DD] in Eritrea has been steadily increasing. This ratio has doubled in the last nine years, moving from 0.927 to 1.875 in the post independence period.

   An increase in t-ratio indicates a shift of deposits towards the time deposits [TD] from the demand deposits [DD]. Usually, the required reserve ratio on time deposits is lower than the demand deposits. Hence, an increase in t-ratio leaves more excess reserves with banks and consequently, this kind of structural change brings monetary expansion.

   The above discussion implies that an increasing t-ratio in Eritrea is detrimental to the rising broad money supply.

iii. The r-ratio, the legal reserve requirement, has been continuously falling in Eritrea. A fall in r-ratio leaves excess reserves with the banking system, and hence, leads to expansion of monetary expansion.

   The falling r-ratio implies that this ratio is being used by the central bank to control the expansion of broad money stock which is possibly being caused by rising t-ratio; as the c-ratio is quite stable in Eritrea.

7.3 Conclusions

The following conclusions have been derived from this exercise:

a. Evaluation of Eritrea's Monetary System

i. Eritrea's central bank, the Bank of Eritrea [BE], was established in 1993. Prior to the introduction of the national currency, the Nak'fa, in November 1997, Eritrea was in a de facto currency union with Ethiopia – using the Ethiopian Bir as the legal tender. In March 1997, the BE proclamation was enacted. The Proclamation was intended to provide for an independent central bank, with extended powers to

issue a legal tender and conduct monetary policy with a broad set of instruments, as well as to license, regulate and supervise financial institutions.

ii. Eritrea's financial sector is small and relatively under-developed, with only a limited range of financial services to offer to the public. The financial sector is dominated by three commercial banks, of which only two accept deposits. The weak structure of the financial sector has resulted in a lack of competition – a situation further under-mined by the fact that its institutions are not always guided by commercial criteria.

iii. There are no foreign banks in Eritrea and it appears unlikely that a foreign bank will establish a presence in the near future considering the country's precarious economic situation. Under such circumstances, the authorities have no other alternative but to strengthen the existing banks by restructuring and consolidations.

iv. In Eritrea, there is only one saving rate of interest and a variety of lending rates. The saving rate in the post-independence period has been continuously falling and with the rising inflation rate, the real rate of saving is turning negative. The average lending rate has almost remained stable with minor fluctuations throughout. Consequently, the spread between saving and lending rates is widening in Eritrea.

v. Eritrea has adopted two concepts of inflation – Wholesale Price Index [WPI] and GDP Deflator. The WPI inflation remained almost stable throughout the post independence period at around 8 percent and then suddenly jumped to an alarming rate of 17.7 percent in the year 2000, perhaps due to the war with Ethiopia. GDP deflator has been very erratic in behavior fluctuating in the range of 29 percent to 2.7 percent in a span of just 9 years.

vi. The Bank of Eritrea allows banks to set their own exchange rates, thereby establishing a mechanism for market determination of the foreign exchange rate, under the Foreign Exchange Regulation Act, which came into force in 1998.

vii. The broad money supply has increased faster than the narrow money supply in the post independence period in Eritrea. The narrow money stock as a percent to GDP has remained almost stagnant whereas broad money stock as a percent to GDP has shown marginal fluctuations. On an average, the average annual growth rates were

14.8 percent and 19.9 percent for narrow and broad money respectively, in the post-independence period.

viii. The annual growth rates of the components of narrow money – currency and demand deposits – have been quite fluctuating all throughout post-independence period, indicating unstable liquidity conditions and preferences in the Eritrean economy. The time deposit, a component of broad money, showed a substantial rise – an increase of six times in just nine years

b. Empirical Analysis of Eritrea's Monetary System

b.1 Demand for Money

i. The demand for money is a crucial factor which affects and determines the level of aggregate economic activity in an economy. A stable demand function for money has been recognized as an essential prerequisite for any meaningful conduct of monetary policy and hence, the importance and interest in the research on the subject. A proper understanding and estimation of the demand for money equation is essential for the critical evaluation of past monetary policies and also for the formulation of future policies.

ii. The study of demand for money refers to the examination of the inter-relationship between money, output and prices. Accordingly, the estimable equation used in the present study is:

$$\log M = a + b \log Y + c\ R + d\ P$$

The above demand for money equation has been estimated for two measures of money stock- narrow money [M1] and broad money [M3] and also; for the components of money stock- currency held by public [C], demand deposits [DD] and time deposits [TD]. It is hypothesized here that income [Y] is positively related to the demand for money [M], whereas the rate of interest [R] and price level [P] are negatively related to the demand for money. The time period taken for the study is 1992-2000. The ordinary Least Square [OLS] method of regression analysis has been used for the estimation of all the specified demand for money equations.

iii. The income elasticity of demand for narrow money [0.908] is close to unitary, implying the proportionate change in income and demand for narrow money in

Eritrea. On the other hand, income elasticity of demand for broad money is quite high at 1.571, meaning thereby that the demand for broad money in Eritrea is sensitive to the economic growth as measured by GDP.

iv. The income elasticity of demand for time deposits is very high at 2.54, compared to the other components of money stock- currency [0.76] and demand deposits [0.958].

v. Rate of interest [R] as an explanatory variable is not listed significantly in the demand for money equation. The interest elasticities have very low values in our estimations [0.07 and below], indicating that the demand for money is interest inelastic.

vi. The above finding on rate of interest supports Friedman's argument in the case of Eritrea. Friedman argues that the rate of interest is not an important determinant of demand for money as suggested by Keynes.

vii. Price level [inflation] as a determinant of demand for money is significantly listed in all the equations except currency. The semi-elasticity of price, like interest, is very low [0.04 and below] in all the demand for money equations, implying that the demand for money is price insensitive.

b.2 Velocity of Money

i. Monetary authorities all over the world strives to control the money supply not for its own sake, but for regulating the flow of spending in economy with a view to containing inflationary pressures. The flow of spending, however, depends upon not only on the total stock of money but also on its rate of turnover- the velocity of money. Velocity of money does not come under the direct control of the monetary authorities. Any given stock of money might be spent faster or more slowly, i.e. velocity of money might rise or fall. Accordingly, a wide range of potential spending levels could conceivably flow from the same stock of money. An expansionary monetary policy may be neutralized by a falling velocity of money. And that is a dilemma various monetary authorities have been facing the world over.

ii. The velocity of money is defined as the ratio of nominal income to the stock of money. Nominal income in our study refers to the current GDP at factor cost. As

Eritrea uses two measures of money stock- narrow money stock and broad money stock, we have defined the velocity of money with respect to both these measures.

iii. The velocity of narrow money is estimated to be, on an average, twice the velocity of broad money in Eritrea.

iv. The tight monetary policy aimed at controlling inflationary pressures would fail to achieve its objective if the contradictory monetary policy instrument is neutralized by a simultaneous rise in the velocity of money. This monetary puzzle [the trade-off] is not applicable in the case of Eritrea as the velocity of money has been quite stable in that country.

v. The velocity of money generally follows a U-shaped pattern, with an initially declining segment, an intermediate flat segment, followed finally by a rising segment. This long-run behavior is influenced by the institutional factors. The monetization process which is dominant at the early stage of development is deemed to be responsible for the declining segment, whereas financial sophistication achieved as the economy matures is said to be instrumental in bringing about the rising segment.

The behavior of velocity of money in the low-income countries confirms to the declining segment while that of the high-income countries corresponds to the rising segment. For the middle-income countries, velocity of money is rising while that of broad money is falling.

vi A careful study of the velocity of money trends in Eritrea indicates a flat but very marginally declining trend. This finding suggests that Eritrea is in an early stage of monetary development and falls under the category of low-income country.

vii. The velocity of money function estimated in this study is:

$$log\ V = a1 + b1\ log\ Y + c1\ R + d\ Vt\text{-}1$$

The above equation has been estimated for both narrow [V1] as well as broad money [V3], using the data for years 1992 to 2000. Both, the real as well as the nominal values of the variables have been used in the estimation of the velocity of money equations.

viii. The income elasticity of money velocity is negative and less than one throughout, implying that an increase in income as measured in GDP reduces the velocity of broad money, however less than proportionately. This finding further emphasizes that the economic growth suppress the velocity of money in Eritrea.

ix. The interest elasticity of money velocity is also negative and very low in value [0.028]. This implies that velocity of broad money is interest inelastic.

x. The lag dependent variable [V3 t-1] is listed significantly in all the equations wherever it has been included with almost the same values of the co-efficients. An important inference which can be drawn from the significant listing of V3 t-1 is that the past behavior definitely influences the present behavior of velocity of broad money in Eritrea.

*c. **Determination of Money Supply***

i. There are two approaches to the determination of money supply: the money multiplier approach and the balance-sheet or structural approach. The money multiplier approach relates the money supply to the reserve money. The balance-sheet approach deals with the individual items in the balance-sheet of the monetary sector in explaining the change in the money supply. This study adopts the money multiplier approach to the determination of money supply, as due to the lack of detailed central bank balance-sheet data; the later approach can not be used.

ii. The value of narrow money multiplier [m1] has varied from 0.493 to 1.014 in the post-independence period 1992 to 2000. The average value of m1 in the said period was 0.769. The value of broad money multiplier [m3] has moved from 1.152 to 2.352 during the post-independence period. The average value of m3 was 1.651 for the same period.

iii. The values of narrow as well as broad money multipliers have been quite stable, as indicated by the low volatility values at 0.216 and 0.269 respectively. However, The incremental values of m1 and m3 have shown falling but volatile behavior all throughout.

iv. An increase in c-ratio [C/DD] brings a rise in money supply. It is so because an increase in c-ratio brings a shift from deposits to currency, and as deposits undergo multiple expansion while currency not, the net result is contraction of money multiplier and the stock of money.

In the case of Eritrea, the c-ratio has almost remained stable with very low volatility. It indicates that the change in money supply in Eritrea is neutral to the c-ratio.

v. The t-ratio [TD/DD] in Eritrea has been steadily increasing. This ratio has doubled in the last nine years, moving from 0.927 to 1.875 in the post independence period.

An increase in t-ratio indicates a shift of deposits toward the time deposits [TD] from the demand deposits [DD]. Usually, the required reserve ratio on time deposits is lower than the demand deposits. Hence, an increase in t-ratio leaves more excess reserves with banks and consequently, this kind of structural change brings monetary expansion.

The above discussion implies that an increasing t-ratio in Eritrea is detrimental to the rising broad money supply.

vi. The r-ratio, the legal reserve requirement, has been continuously falling in Eritrea. A fall in r-ratio leaves excess reserves with the banking system, and thereby, leads to expansion of monetary expansion.

The falling r-ratio implies that this ratio is being used by the central bank to control the expansion of broad money stock, which is possibly being caused by rising t-ratio; as the c-ratio is quite stable in Eritrea.

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