

Money Supply, Income and Prices in Sudan

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1. Introduction

Economic disorder in developing countries became a way of life with reasons of economic mismanagement, corruption and favoritism and political crisis can manipulate economic decisions.

Sudan is not different where some researchers described what is happening there as economic chaos. Though economic deterioration is part of everyday's happening in many countries, Sudan is unique in its abnormal policies and economic mismanagement. The document reviews impacts of money supply on income in of Sudan. In 1990 a package of policies was implemented to solve the shortage of foreign exchange problem. Free market economy was adopted through liberalizing trade and exerting efforts to promote and boost exports, besides adopting encouraging policies for the benefit of increasing productivity. Whenever exchange rate is determined by the market forces with weak economic productive base the impacts fall on income. Implementing floating exchange rates were implemented to increase exports. Commercial banks were encouraged to extend finance to the export sectors, which was considered as a priority sector in all government policies. Trade started to flourish and bilateral agreements between Sudan and other countries started to thrive. With these radical changes the Bank of Sudan issued the circular in which the free and the official markets were abandoned and the exchange rate determined through a committee affiliated to the Sudan banking association. Dealing in foreign exchange was allowed through the official channels. Restrictions on the flow of foreign currencies were abolished and opening free accounts was allowed. This unified free market-rate that dominated all dealings. Policies aimed at filling the gap in the trade balance through encouraging exports and restricting imports. The latter objective, reducing imports, was pursued through banning the importations of ten commodities. That reflected on the real exchange rate, the experiment of the parallel exchange rate policy contributed in accelerating the economy growth of country. However, authorities canceled the official and the commercial bank exchange rate and reintroduced a unified official regime under which the rate of exchange was freely determined in the interbank market by the independent actions of the commercial banks. That had impacts on market exchange rates for foreign currencies and a set back to income per capita. Official foreign exchange requirements were met through the compulsory sale to the Bank of Sudan by the commercial banks of 50% of proceeds at the commercial banks selling rate. The imports policy remained unchanged, where all imports were allowed except wine and strong drinks. The result was an environment of economic uncertainty that leads to gradual downfall of the productive activity.

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2. Review

Economic progress is the vital objective in all policies advocated and the rate of progress is the significant variable in an economic system. Economic growth and development of a country depend on the economic efficiency of the nation. It tells us how people have to sacrifice the present wants in order to achieve higher income and better standard of living in the future. Every nation endeavors to increase its national income. There are two important elements in economic growth, that efficiency should be mode use of fully and effectively and it should be increased to achieve higher growth rate. If the economy does not operate to its full potential output level, wastage will result (Sankran, 1988). The purpose of this document is to analyze development in the Sudanese economy. The case of the monetary supply involves the credit system and its impact on the general level of prices and national income development during the period of national comprehensive strategy. Before the Sudan attained political independence in 1956 its economy displayed all characteristics of the colonial economy, on attaining political independence, it was thought by the authorities that logic necessitated consistency in the management of money credit policy. In 1957, the *Sudan Currency Board* (SCB) was established to undertake the issue of a Sudanese currency. That was through the national bank of Egypt. The ministry of finance and economics was the only institution in charge with responsibility of managing the foreign exchange. The Bank of Sudan Act was worked out such a manner which rendered it broad and permissive enough to take care of any future provision or action which the bank might wish to take certain amendments were made in 1962 and, 1969 to enable the bank to have more flexibility in its operations. Between the times the Bank of Sudan was established, until nationalization took place in May 1970, new banking institutions were created. The first two commercial banks were established in 1962. It received considerable encouragement and assistance from the Bank of Sudan and so on. In the following stage and up to 1990, there were different economic plan and monetary policies. All those policies did not success, for more than one reason. For example, Policies were issued in 1986, the main features were: rationalization of available foreign exchange, the dealings outside the official channels dropped sharply, the declaration of the amount of foreign currencies held by citizens on arrival or departure of the country was imperative, A

committee was formed to deal with the resources of the free market and it was made up of the managers of some commercial banks (Abuobida, 1997). The fact is that all those policies failed because, that did not comprise of all sectors of national economy.

In the modern economics governments have to manage the monetary system of their countries. That the efforts of monetary authorities (Central Bank) is to increase the benefits of existing monetary system and to reduce the disabilities in the process of economic development. For achieving these targets, in the process of economic from time to time and country to country depending upon the exigencies and the requirements of nation. It that can be set, in as stability of foreign exchange rate, price stability and full employment, economic growth with stability.

There are problems of fluctuating, e.g. the money supply and the general level of prices have been facing several problems in the Sudanese economy. The inflationary spiral the country endures is a witness of this phenomenon. It is the severest since the independence of Sudan in 1956. Despite the created potential of the Sudan in land, water, material resources and human resources, it has faced many hazards which made it difficult for the country to develop. These, in the last three or four decodes, the Sudan started to fall in the debt trap, deficit in the balance of payment and the balance of trade, reduce gross domestic product (GDP), expensive imports of technological equipment. The whole problem, thus, was reflected on the purchasing power of the consumers which have greatly diminished. Meanwhile, the public sector loosened its grip over the market because of the privatization of many of its enterprises. As far as the banking system is concerned the government had yielded to deficit financing during the same decades. The Bank of the Sudan, in collaboration with the ministry of finance and national economy had set credit ceilings for the commercial and the other banks. However, that was not exactly applied. In name financing was thus confined to priority sectors set by government and the Bank of Sudan. At the same time, the policy meant to limit the liquidity of the money supply and avoid the rise of inflation¹. By the same measure, money supply is considered the basic variable in the Sudanese economy this is because the aggregate supply of money is most effective in the general level of prices. Thus, it is noticed that there an expansion in money supply, from LS 3,801.1 millions, to LS 9,500.1, to LS 7926 millions and LS 19,852.6 millions, in the years 1988-1989-1990 and 1991 respectively for 1992, money supply reached LS 141,594.5 millions.

Thereby we focus on the following themes:

1. to investigate the roots of the problem of money supply, national income growth,
2. study the factors which led to its continuous increase. There are numbers of influences which reasoned in the increasing of the monetary supply (Monetary Base) in the economy during the specified period,
3. examining factors determined the aggregate supply of money.

The outline of the money supply impact on the general level of prices involves national income developing during the period of the study. It is hypothesized that money supply is continuously increasing. This is the tendency to increase actually started in the period of 1992 throughout. The main reason for the rise may be attributed to the policies of liberalizing which was accompanied with the high inflation in the economy, and deficit-financing the public sector from the banking system. In addition to that external factors as imports of agricultural and petroleum equipment and others added to that effect. Money supply has increased during the period (1992-2000) with prospective of continuous

¹ Such measures, however were only applied on to the public. They were not applicable fo the regime's cabal. Political power and pressures were used to obtain financing for the regime's elite without restrictions. Probably such financings were used to buy the pivitized public corporations and institutions. The facts were revealed to the public through clandestine channels after the banks' crisis in 2008 where the main cause was the estimated of more than US\$ 15 billion dollars of unrefundable, dead debts. The scandal is known as the jokers' heist.

increase. That is probably due to policies of liberalization. The result was expanding inflation. The latter has resulted in expanding governmental deficits and increasing dependency on financing the public sector from the banking system.

The methodologies adopted are the descriptive and analytic approaches. The methods of data collection are mainly those concerned with secondary data, in the form of reports of the Bank of Sudan and the national economic survey of the ministry of finance and national economy for the years 1992, to the year 2002 in addition. The relevant books and periodicals are going to be consulted. No primary sources of data are going to be consulted. No primary sources of data are going to be sought. Provide information which have been lacked before, with special reference to the progressively of the money supply system and the money reserves relations in Sudan and analyzing the performance of the money supply in Sudan during the period (1992-2002).

3. Theoretical Framework

In our study of money and price, one of the basic problems is to find out the factors determining the value of money or the factors which change the purchasing power of money. The view of the classical model yields a perfectly inelastic aggregate supply curve at the output level that is consistent with full employment. Although this curve specifies what the output level must be in this model, it does not specify which of the various price levels along this supply curve will be the prevailing price level. To do this, classical theory relied on the quantity theory of money. This theory of money holds that the quantity of money in the hands of the public determines how high or low the price level will be. In its crude form, the theory states that the price level or the value of money is determined by the supply of money. The value of money according to this theory, varies inversely as the supply of money; the price level on the contrary, directly as the quantity of money. If the quantity of money increases two-fold, other things being equal, prices will double themselves and value of money will decline by one half, other things being equal. It is expected that prices will go down by 50 percent and the value of money will be doubled. The theory assumes that the velocity of circulation of money is stable and the volume of goods and services to be changed for money remains constant. The theory tries to emphasize a mathematical relationship between quantity of money and the price level on the one hand, and the quantity of money and value of money on the other. That is explained by a perfectly inelastic tendency from an aggregate supply curve. Although the public may choose to use currency and demand deposits as a store of value, the classical view was that the public uses other assets like interest-bearing savings deposits and securities as a store of value. It was maintained that the assets that make up money, were used almost exclusively as a medium of exchange. Furthermore, the relationship between changes in the money supply and in price level was held to be strictly proportional. This conclusion depended on several assumptions that may most simply be revealed by examining the identity

$Mv = py$, in which m is the supply of money, v is its velocity or the number of times it turns over per period in the purchase of final output y , and p is the price level of this output. Before Keynes's general theory appeared in the mid 1930s, the thinking of economists about the role of money interpreted in the economic thought, was largely summed in the *quantity theory*. The best starting point for discussion of the quantity theory of money is the equation of exchange, which may be expressed algebraically. In the above equation, m is the money supply; v the income velocity of circulation; p the general price level; and y the real income. Expressed in this form, the equation of exchange is simply true, for it must follow that *the quantity of money multiplied by the number of times each unit of money used in certain period and equals the goods and services produced during the period times the average price level*

for the goods and services. Each side of the equation represents a different way of describing the same things. Altruism, however, should be emphasized because it does not fully explain or theorize the phenomenon. Nevertheless, it may provide a convenient starting point for the development of an economic theory. The classical view that the level of output is stable in the short-run, simply reflects the fact that the fully employed labor forces works with a fixed stock of capital and given production techniques in the short-run. The production function can shift outward or to the right with growth in the capital stock and technological advances, resulting in a rise in the level of output consistent with full employment that as rightward shift in the perfectly inelastic aggregate supply curve. However, these changes occur only gradually over the long-run. The labor supply curve can shift to the left with the same result, but this change also occurs gradually with the growth in population over the long-run.

The classical view that the velocity of money is constant is based on the argument that the institutional, structural, and customary, conditions that determine velocity usually change very gradually. Among these conditions is the frequency with which economic units receive and make payments, the regularity of these receipts and payments and the portion of such receipts and payments that is made on a money or barter basis. Although these and all other conditions affecting the size of v are subject to change, the quantity theory asserts the gradualness of such change in support of its conclusion that v is constant in the short run. To understand the classical relationship between the money supply and the general price level, it is necessary to understand the classical attitude toward money. To the classical economists money was simply a medium of exchange. It's only important function was to facilitate the real process of exchange, which was one of exchanging goods for goods. As a consequence, in this view, therefore, more in circulation in the economy would always mean more spending.

The contemporary quantity theory is the central thesis that the quantity theory of money maintains that there is a predictable relationship between money stock changes and gross national product changes. This follows from the facts that the supply of money can be determined independently of the demand for money and that the demand for money is stable relative to its determinants (Klein, 1980). According to monetarists, the demand for money and its inverse (velocity) have stable functional relationship with their determinants. They use much the same determinants as, income, wealth, the rate of interest, and price expectations. The demand for money is not a constant for monetarists. They merely state that there is a predictable relationship between the demand for money and its determinants. As the income velocity of money demonstrates a regular behavior pattern.

Keynesians would agree that the demand for money is function of income, wealth, and the rate of interest, because they believe that the transactions and precautionary components of demand are repetitively related to the level of income and that the speculative demand for money is inversely related to the rate of interest. For those Keynesians who have become now Keynesian portfolio theorists, wealth is an important determinant of the demand for money, although money itself is regarded as only one of a group of competing financial assets. However, they disagree with monetarists concerning the role of price expectations in the economy. There are three versions of the quantity of money, the transaction approach, the cash balance approach and the real balance approach.

The transaction version (Fisher's equation of exchange) of quantity theory of money was formulated by Irving fisher is popularly. According to Fisher:

$$Mv = py \text{ or } p = mv / Y$$

Were m stands for the quantity of money in circulation including coins and banknotes, but excluding bank reserves and the money held by the treasury. V represents the velocity of

circulation. This is obtained by dividing the aggregate volume of money payments in given period by the units of in the circulation. In short, the velocity of circulation means the average number of times each unit of money is spent on the purchase of goods and services. P refers to the general price level and y stands for the total volume of transaction for which money payments are made. It includes; goods, services, and securities and it equivalent to the physical volume of trade. The product of m and v gives the aggregate effective supply of money (or total money expenditure) during a given period of time. The product of p and y represents the money volume of all goods and services bought during the given period of time. That indicates the total demand for money. The demand for money is essentially, whereas the demand for transaction purposes and money is not demanded for its own sake, but for goods and services. The total quantity of money (mv) will be equal to the total value of all goods and services bought and sold (py).

The previous presentation is expressed as $p = mv/y$ which implies that the quantity of money determines the price level, and the price level in its turn varies directly with the quantity of money, provided v and y remain constant (Sankaran, 1988). The value equation considers only currency money. In modern economy, bank's demand deposits or credit money and its velocity play vital parts in business. Therefore, Fisher extended his original equation of exchange to include banks deposits m_1 and its velocity v_1 .

The revised equation is:

$$Yp = mv + m_1v_1 \text{ or } p = mv + m_1v_1/y$$

From the revised equation, it is evident, that the price level is determined by the quantity of money in circulation m , the velocity of circulation of money v , volume of bank and credit money m_1 , the velocity of circulation of bank or credit money v_1 and the volume of trade. That establish the basic proposition in this equation of exchange that the price level or the value of money is a function of the supply of money, provided other things remain constant. That includes v , m , v_1 , and y . If other things remain constant, P will change in direct proportion to m . Fisher postulates that p changes as a result of changes in other variables in the equation while P has no independent movements.

3.1. Cash Balance Approach

The foregoing is the version of the classical quantity theory of money that was largely worked out during the nineteenth century. The English economist Alfred Marshall of Cambridge University gave a more elaborate and sophisticated version of the quantity theory as it was developed. In this approach, known as the Cambridge version of the quantity theory, emphasis is shift to the desire of individuals to hold a definite quantity of cash balances. Marshall put the matter as, in every state of society there is some fraction of their income people find it worthwhile to keep in the form of currency; it may be a fifth, or a tenth, twentieth. Herein the basic difference between fisher and Cambridge approach is founded. The former interpreted demand for money for transaction purposes only, as money is only a medium of exchange. But the later interpreted demand for money for holding it, the liquidity preference. Accordingly, the higher the liquidity preference, the greater will be the demand for money.

The value of money according to the Cambridge economists depends upon the supply of and demands for money. The demand for money *connotes* demand for holding money. With a given demand, the value of money varies inversely and the price level directly with the quantity of money. On the other hand, with a given supply, the level of money varies directly and the price level inversely, with the demand for money. According to Sankaran and Wallace, an increase in the demand for money denotes people's desire to hold more money which means lesser demand for goods and services. Consequently, the price level will fall, but the value of money will rise. Conversely, a fall in demand for money calls for

holding. This results in higher expenditure. Consequently, the price level will rise, but the value of money will fall. The relationships between these are expressed in equations which are known as Cambridge equations. We shall discuss some of the important Cambridge equations:

$M = krp$. Where M is the amount of money in circulation at a moment of time, R is the real national output of goods and services per-unit of time, P is the price of R, and K is the proportion of RP that the community wishes to hold enough money to the purchase.

In stable community the quantity of money in existence is also that which people wish to hold, having regard to the level of output, its price level, and other preferences as regards the form in which they hold their resources. The equation is closely related to the various equations, some of them, discussed earlier. If we consider the equation $MV=PY$, in which PY refers to gross national product. The PY of this equation may equated with RP in the Cambridge cash - balance equation, PY and RP have the same meaning as long as the unit of time is a year. Therefore, the equation may be rewritten as $M=KPY$, and it maybe restated as $M=PY/V$. In other words, K and V are simply the reciprocals of each other; the demand for money to hold and the velocity of circulation of money are the inverse of each other. Assume, for example, that the money supply, M, is used four times in the course of a year to purchase PY. This is just another way of saying that in the course of a year people on the average, held an amount of money equal to one-quarter of the value of their expenditures on PY starting the relationship between money and PY in this manner enables us to focus on the motivations for demanding money to hold. Marshall for example, stressed this when he reasoned the total value of a country's currency, multiplied into the average number of times of its changing hands for business purposes in a year. IS of course is equal to the total amount of business transacted in that country by direct payments of currency in that year. Such identical statement does not indicate the causes that govern the rapidity of circulation of currency. In order to analyze them we must look the amount of purchasing power which the people of that currency elect keep in the form of currency. Changes in the rapidity of circulation of money are themselves incidental to the amount of ready purchasing power which the people of a country find advantageous to keep in their holding. Nevertheless, both velocity and cash balance approaches are equally valid. The latter is considered more satisfactory because, the preceding quotation as Marshall implies, the cash-balance equation is more directly related to individual motivation. In addition, it conveniently fit the economic basic concepts of supply and demand.

The Real Balance Approach

Reformulation of the quantity theory of money was postulated by Shapiro (1982), like the quantity theorists, Keynes, believed that the transactions demand for money depend on the level of income and in any specific way on the interest rate. The classical, as well as Cambridge versions of the quantity theory of money do not throw much light on that option and gave another theoretical framework. They did not precisely and clearly tell us about the causal process by change in the price level. Thus, the classical analysis suffers from a dichotomy approach relating to the theory of relative prices and the theory of price level. To them, the relative price of commodities is determined by the relative forces of demand and supply. The price level, on the other hand was considered to be the result of the quantity of money and its velocity of circulation. In contrast, Keynes, theory of prices is of a more general nature. He has integrated the theory of money with the general theory of value and output. The classical economists held the view that increases in the supply of money directly increase the price level. Keynes, held the view that increase in money supply caused the increase in price level indirectly through rate of interest, income, output, and employment. The initial impact of increased money supply, according to Keynes, will

be on the rate of interest. As more money is available to satisfy the liquidity preference of the people of speculative motive, the rate of interest will fall. Lowered rate of interest will lead to promote investments. Increased investments lead to increased income. Thus the process will go on increasing employment and output. In this process, the cost of production cannot remain unaffected. The increasing cost will lead to increasing prices. The classical rigidly separated the monetary theory (quantity theory of money) from the general economic theory and established a direct link between money and prices. Keynes, analyzed the causal process very cogently through employment, output, income, and increased cost of production and increased prices. Keynes's theory emphasizes money as store of value and between the present and future. This has enabled him to successfully integrate the monetary theory with the general theory. Meanwhile classical economists failed to integrate these theories, as that gave recognition only money as the medium of exchange. According to Keynes's equation of the real balance quantity monetary reforms were based. It states that the holder of money requires a quantity of real balance which is in an appropriate relationship with the quantity of real transactions upon which that balance is spent. He measured real balances by consumption units. The equation is:

$$N = PK \text{ or } P = n/K$$

Where n = is the total supply of money.

P = is the general price level of consumption goods.

K = is the total quantity of consumption units which the people decide to in the form of cash

K = indicates those consumption unites for which the purchasing power is kept by the people in the form of cash.

Keynes, refers to K the real balance as the constant that represents a change that causes a direct proportional change in P . If the quantity of money in circulation is doubled, it causes the doubling of price level. Keynes gave the equation to include bank deposit the equation as:

$$N = P (k + rk_1) \text{ or } P = n / k + rk_1$$

Where r represents the ratio of bank's cash reserves to their deposits; k_1 represents the number of consumption units the community decides to hold in the form of bank deposits. Keynes' equation is formulated on the assumption that people keep some cash with them to finance their consumption and the bank keeps some cash to meet the demand for withdrawals. These constitute the demand for money. If k , k_1 and r , are assumed to be constant, a change in n will cause a direct and proportional change in P . Keynes, assumed that, k , k_1 , and r , will remain constant in the short period with some critics on this equation.

4. Measures of Money Supply

Money is sometimes defined in terms of the jobs it does. It services as a means of paying off debt, a medium of exchange, a unit of account, a store of value, and a standard of deferred payments (Klein and Samuelson) essence of what money is may sum up as follows: *money is the modern medium of exchange and the standard unit which prices and debts are expressed.* By controlling the behavior of money and credit, the government through its central reserve system hopes to affect the balance of saving and investment expenditure; the level of real and money GNP, and hence the rate of price-level inflation. The above definition is including, three kinds of money: coins, currency, bank deposits. The most widely adapted definition of money counts as money anything that is generally acceptable in payment for goods, services, and other valuable assets and for the discharge of debts. Money's functions are already discussed whereas some others were mentioned by Paul Samuelson. He describes money as a medium of exchange enabling us to transact our national income and

product without recourse to hopelessly inefficiency barter. That shapes the unit of account in which we express prices for current transactions; and also the unit of account for future or deferred transactions.

Thus, money is a safe way of holding at least part of one's wealth safe against the ups and downs inherent in stocks, land, homes and bonds. When all these are going down in price, the canny hoard of money is the most successful speculator in the community when prices rise. However, money holders can suffer in real purchasing power if prices are affected by instable economy or high inflation rates conditions. Money holding is a necessary precaution against having a sudden expense occurrence, against an unexpected delay in a receipt due from someone else. Similarly, it helps one take advantage of a bargain in goods or in securities that might suddenly come up. The supply of money is the total currency amount of all those things that are generally acceptable by the public in payments for goods and services and other valuable assets and for the discharge of debts. The things that are most obviously money in this sense are currency including coins and demand deposits. They are some times identified as money. However, although demand deposits are definitely money, checks are just are definitely not money. Monet's thought shows that they are merely the device by which a transfer of a specific amount of money is made from the demand deposits of one partly (person, firm, or government unit) to another party. That amounts in the demand deposits of the none-bank public on any date that is to be counted as part of the money supply on that date (Wallace C. Peterson). Currency and commercial bank demand deposits held by the public are the only assets that qualify as money according to the narrow definition of money given. However, changes that occurred during the 1970s added some other assets to the test. These include *Negotiable Order of Withdrawals* (NOW) accounts at savings and loan associations and commercial banks, *Automatic Transfer Service* from savings to demand deposits, (ATS), accounts, credit share draft accounts and demand deposits accounts, at mutual savings banks. The central reserve definitions of money in circulation begin with the measure of money that is most closely linked to the money base and then proceeds to enlarge this definition by adding specialized types of financial assets that have an important money role. That was although they are not necessarily of the kind that are used by the general public the central reserve new calls M_1 and it consists of currency outside the treasury, demand deposits at all commercial banks, checkable deposits at other financial institutions and traveler's checks of nonblank origin. Those are the most widely used measure of money in circulation and correspond closely to common notion of what money M_2 is. The latter consists with M_1 plus saving deposits and small time deposits at all deposits institutions and two types of assets, which means assets redeemable the next day.

M_3 consists of M_2 plus large time deposits and private sector aggregate investments. M_4 comprises M_3 plus other liquid assets such near-money assets (money market investments).

According to Shapiro the central bank reserve can control the total currency amount, the central bank determines the maximum amount of demand deposits that can be outstanding amount of demand deposits is at its maximum.

The following equation demonstrates the previous postulations:

$$R = rd D$$

Where, R = currency amount of reserve, rd = percentage reserve requirement against D .

D = demand deposits. Thus, we may rewrite this equation to show that D depends on R and rd by dividing both sides by rd , $D = R/rd$ in this form, the maximum amount of D is immediately identified for any combination of values for R and rd . For the same rd of 0.20 but a different R of \$24 billion, D will be \$120 billion or for R of \$25 billion; or for R of \$ 24 billion; and rd of 0. 25 D will be \$ 96 billion.

Table (1) The Balance Sheet: all commercial banks (Hypothetical figures in billions)

Assets		liabilities & cap accounts	
Reserves	\$25	Demand deposits	\$125
Loans & securities	105	No deposits liabilities	15
Other assets	20	Capital accounts	10
Total assets	\$150	Total liabilities & capital accounts	\$150

The preceding equation may also be written as follows:

$$D = (1/rd)R$$

Here $(1/rd)$ the reciprocal of the percentage reserve requirement is called the deposit expansion multiplier. We determine the deposit expansion multiplier from the value of rd , and we determine the maximum amount of D the banking system can support with any given amount of R by applying that multiplier to R . Because, $R = \Delta D$, it follows for any given value of rd that $\Delta R = rd \Delta D$.

Dividing through by rd and rearranging gives us $\Delta D = (1/rd)\Delta R$ this is the maximum change in D that will result from any change in R , assuming no change in rd . The maximum change in D that will result from any change in rd , assuming no change in R , is calculated as $\Delta D = R\Delta(1/rd)$.

To understand the full meaning of these equations, suppose now that the bank reserve takes actions to increase R by \$100 billion, But leaves the percentage reserve requirement unchanged. If that requirement happened to be 20 percent and if the banks as a group already had no their books the maximum amount of D consistent with the preexisting amount of R , the maximum increase in D is found by substitution: $\Delta D = (1/rd)\Delta R = (1/0.20)\$100 \text{ billion} = \$500 \text{ billion}$. Given the same assumptions, if the bank reserve were to take actions to reduce R , by \$100 billion, the result would be $\Delta D = -\$500 \text{ billion}$.

To take at the in which the central reserve changes rd but leaves R unchanged, assume rd is cut from 0.20 to 0.19 at a time when $R = \$25 \text{ billion}$. A change in $1/rd$ from $1/0.20$ to $1/0.19$ or from 5.0 to 5.263 means that $\Delta(1/rd) = 0.263$. Again, the increase in DD is found by substitution.

$$\Delta D = R \cdot \Delta(1/rd) = \$25 \text{ billion} \cdot 0.263 = \$6.575 \text{ billion}$$

Give the same assumptions, if the central reserve requirement were to rise the percentage reserve requirement from 20 to 21, $1/rd$ would decline from 5.0 to 4.762 and Δrd would be 0.238, with R of \$25 billion, the result would be $\Delta DD = \$25 \text{ billion} (0.238) = \5.95 billion . The Instruments of monetary control: the changes in DD shown by the equations for changes in R and rd are the end product of a process that works itself out as the commercial banks adjust to changes in currency amount of their reserves or to changes in their percentage reserve requirements. We will look briefly at the instruments the central bank reserve employs to produce changes in the reserve positions of the commercial banks. In its attempt to stabilize the economy by increasing or decreasing the money supply (via deposits), the central bank reserve relies primary on instruments that produce changes in R . We first took at these instruments and then at the less frequency used instrument that produces changes in DD by varying rd and therefore, the deposit expansion multiplier. The monetary policy has broad and diverse adjectives such as stabilizing price level, keeping unemployment low, fostering economic growth, and balancing the flow of payments to and from other countries.

4.1. The Reserve Requirements

Unlike open-market operations and changes in the discount rate, changes in percentage reserve requirements do not affect the amount of reserves, but alter the amount of demand deposits that each unit of reserves can support. In other words, its use changes the deposit expansion multiplier.

A unit of R will support \$5 of D if $rd = 0.20$. Because rd of 0.20 yield a multiplier of 5 or $1/0.20 = 5$. A unit of R will support a large or smaller number of units of D at a lower or higher value for rd , if total reserves are \$25 billion, a cut in rd from 20 to 19 percent will raise the previous maximum for D by \$6.975 billion; a hike in rd from 20 to 21 percent will reduce the previous maximum for D by \$5.9 billion. The central bank reserve has seldom used changes in percentage reserve requirements in recent years. There are various reasons for the minor role played by this instruments, one of which reasons is declining relationship in the central banks reserve system had also been an important problem until 1980s, when USA congress empowered the federal reserves to take corrective action. Commercial banks, like other businesses, seek profits. Reserve of member banks are entirely nonbearing assets. Higher percentage reserve requirement means that a larger fraction of these banks, total assets must be held in nonbearing form. There is considerable doubt as to the merits of using variable reserve requirements as an instrument of economic policy contra cyclical increases are unpopular in that the create management difficulties for bankers and forces banks to contract sharply in the absence of offsetting open-market operations. Moreover, contra cyclical reductions may prove to be undependable in economic crises. For example, it is often argued that banks cannot be forced to expand loans and investments; therefore, almost any type of central bank action designed to expend reserves and thereby economic activity will be ineffectual. A change in reserve requirements is a blunt instrument of policy. Full utilization of the money creating potential of a reserve requirement reduction could create undesired inflationary pressures in the absence of offsetting open-market sales of government securities. A decrease in the potential amount of money after a reserve requirement increase could cause recession in the absence of a purchase of securities by the central bank. Only if variations in reserve requirements were substantially less than 0.5 percent could they be used without offsetting open-market operations.

5. The Role of Commercial Banks

Theoretically, the contribution of the commercial banking system to economic growth and stability depends on the sources and uses of the banks funds. To help promote growth, bank need expanding source of funds. To help maintain economic stability, bank operations should not intensify economic fluctuations. Commercial banks have a dual role: they are both money creators and profit seeking business enterprises. Commercial banks follow suit, they trend to expand their loans during periods of economic upturn and contract loans during economic down-turn. In the absence of compensating actions by government, this expansion and contraction of the deposit part of the money stock.

Our analysis suggests that normal commercial bank loan operations can perversely affect the economy at both ends of the cycle, either worsening recession or feeding inflation. Yet, commercial bank demand deposits constitute the major part of our money supply. Almost 75 percent of our money is in this form, and about 90% of all transactions in the economy are check transactions. For this reasons, banks have a responsibility that transcends that of other business enterprises. They are responsible for the creation, destruction, and administration of much of our money. Consequently, they are also responsible to a great extent for the welfare of the economy (Klein, Money and economy, 1982).

Financial intermediation commercial bank and thrift institutions serve as financial intermediaries that intervene between the ultimate lenders and the ultimate borrowers. When people deposit money in their savings accounts, they do not have to seek out borrowers prepared to pay them interest. They are making funds available to the bank to loan-out to borrowers, the bank, with its staff of loan officers and credit investigators, determines which borrowers should receive loans for example for car purchases, home mortgages, or business loans. Banks make a profit by paying their depositor s, a lower rate

of interest than the interest they charge on loans. Depositors and borrowers are willing to accept this arrangement, because they are saved the task of finding each other and assuming the risk of bad loans. Moreover, financial intermediaries are willing to borrow short and lend long—something individual lenders would be reluctant to do. The balance sheet of a bank or any other business is called a T-account, because assets are recorded on the left-side of the (T) and liabilities on the right-side. The balance sheet of the bank summarizes its current financial conditions by comparing its assets (what it owns) and liabilities (what it owes).

The combined assets of all commercial banks are shown in the table below: assets must equal liabilities plus net worth – all assets must be claimed by someone, either by the owners of the bank or by non-owners. The net worth of the owners of the commercial banks equals total assets minus liabilities to non-owners, the sum of deposit liabilities and other borrowings as the following parameters,

1. Assumed consolidated balance sheet of commercial banks:
2. Assets Liabilities
3. Vault cash Transaction deposits
4. Reserve at central bank Savings deposits
5. Securities Time deposits
6. Loans Other than borrowings
7. Other Assets Net worth
8. Total

(Source: Paul A. Gregory. *Essentials of Economic Banking*, 1995)

The main business of banking: bank liabilities are deposits, which primarily in the form of checking account deposits, savings deposits and time deposits. Basically, commercial banks do business by accepting deposits and either investing these funds in interest-bearing securities or loaning them out to be borrowers. Banks earn profits through the interest rate spread. Which is the difference between the interest rates that banks pay their depositors and interest rate, they receive on other loans and investments. The major business of banking is the making of loans fractional reserve banking the consolidated balance sheet reveals the most striking features of the business of banking.

The importance of the commercial banks has come from its role in the developing of the national economy as a financial intermediary between the ultimate lenders and the ultimate borrowers. In order to achieve the comprehensive development policy of national economy that is referring to guarantee easily removing of financing to the priority sectors of economy in the country. That also offset growth rate in the GNP, and to achieve equivalence between consumption and saving. Such as the modern commercial banks perform a variety of developmental and promotional functions, which in determining the value of banking financial, according to announce policies in the country, which depends on the resources volume of various deposits and the positive difference for paid-up-capital and reserves minus fixed assets and extent applying in several economic sectors. (Mustafa Zakaria valuation of banking system, 1994). The supply of money is determined through many factors among them; behavior of public, commercial banks and, central bank, but the central bank is considered exogenously variable, while behavior of public and commercial banks are considered important endogenously variables, that means many factors are contributed more to decide the bulk of money supply other than the central bank. Legal reserves ratio is important in determining of the supply of money; increasing in the reserve ratio decrease the money supply and, decrease in legal reserve ratio, increase the supply of money. All that is taking place through operations of the commercial banks under supervising of the central bank. In the Sudan, the legal reserve ratio is the important element for the monetary policy, which uses by the central bank in the influencing way on the size of money supply that is consisting with deposit reserve, and legal reserve ratio. As

usually the central bank issues in order to the commercial banks to put into it determined level of legal reserve ratio. That is

$$R = R_r \cdot D$$

Where R = required reserve

R_r = required reserve ratio.

D = Total deposits.

In the case of decreasing legal reserve ratio, assume that decreasing in the volume of legal reserve –itself and vice-versa if rise legal reserve ratio also the volume of legal reserve in the central bank rise. As a must linked this ratio reversely with excess reserve of banks, which is known as a different between total reserve of banks and required reserve.

$$ER = TR - R_r$$

Where ER = excess reserve

TR = Total reserve

R_r = required reserve ratio.

The most important function of commercial bank is to accept deposits from the public. Banks maintain demand deposits accounts for their customers and convert deposit money into cash and vice-versa, at the discretion of the latter. Demand deposits are technically accepted in current accounts, which are withdrawable at any time by the depositor by means of check. The other major function of commercial banks is to extend loan and advances, out of the money which comes to them by way of deposits, to business men and entrepreneurs, against proved securities. Commercial banks also important services by providing an inexpensive medium of exchange, such as checks in modern business transactions, the use of checks to settle debts is found to be much more convenient than the use of cash, the check is also known as the most developed credit instrument. Bankers perform certain functions for and on behalf of their customers such as collection and payment of promissory notes, checks bills and other commercial instruments, interest dividends, rent or other periodical receipts and payments such as insurance premier.

Modern commercial banks usually perform certain general utility services for society such as letters of credit that may be given by the banks to their customers to enable them to go a broad, bank draft and traveler's. check are issued in order to provide facilities for transfer of funds from one part of the country to another, banks may deal in foreign exchange and finance foreign trade by accepting or collecting foreign bills of exchange. There are some other services rendered by Sudanese commercial banks.

Allied deposit schemes: current accounts; saving accounts; fixed or term deposits; monthly income deposits; cash certificates; annually or retirement schemes; formers deposits schemes; i. e., Deposits linked with social benefits; insurance –linked savings bank accounts; housing deposits schemes; salary reserve schemes; services provided for depositors as indicates above in this chapter (Shadia Ahmed, the determination of monetary in Sudan. 1997).

Commercial Banks Advances for the years 1990 -2002

Year	agriculture	industry	exports	imports	Trade	Others	Total
1990	84	176	216	22	78	191	1. 767
1991	373	277	257	28	193	275	1. 403
1992	1. 125	455	570	27	383	740	3. 311
1993	1. 865	827	1. 154	43	318	1. 056	5273
1994	2946	1840	2. 236	105	566	2380	10073
1995	3579	2618	3946	1227	418	2726	14514
1996	8997	6385	6643	1705	1216	9003	33948
1997	12522	7284	8387	858	1738	10767	41556
1998	15763	8908	8114	325	2038	12235	47383
1999	14833	7184	8359	1519	2816	14021	48732

2000	17807	8343	16839	1125	8243	26867	79224
2001	19. 605	16445	21832	4107	20900	28450	111339
2002	22837	20850	21970	7. 078	36230	51,055	160020

Source: Bank of Sudan: Annual Reports 1990-2002.

6. Conclusions

The paper attempted to specify the main determinants of cash outflow from banking sector and to capture its major impact on Sudan economy during 1972-2001. A model of twelve equations were formed introducing as endogenous variables: the effective money demand, money supply, real balances, cost of resources adjustment, aggregate demand, the GDP, the capital, private investment, inflation rate, bank loans, velocity of circulating money, and the budget deficit. Where the exogenous variables were: general price index, the real output deviations, quasi money, real local currency exchange rate, the labor force, private savings and bank excess reserves. To obtain the results, the research apply the econometric method IW2SLS.

We summarize and put the next points as follows:

1. Monetization in Sudan for the study period depends directly on the availability of Banks loans.
2. Money Supply is greatly an endogenous macroeconomic variable mainly determined by liquidity preference of the public, but less significant affect by the price level, and insignificant by the trend of real output.
3. The expansion in bank loans causes the following impacts, enhance inflationary pressures via increasing liquidity demand, enhance monetary growth via perception of CBS to the growth in the demand for liquidity, which in turn rises resources cost of adjustment, pulling up the aggregate demand and thus inflationary pressures.
4. Monetary growth which may be associated with slow down of money velocity, so the economy may suffer some recessionary features and encourage large deficits by the Government, which may pull aggregate demand causing the inflationary pressures.
5. Expansions in bank loans causes no effect on the real side of the economy.

The Policy Implications: (Monetary growth shock) concerning the impacts of raising reserve requirements:

1. Creating an inflationary process which may cause declining real monetary growth and may de-accelerate money velocity causing pulling downs in aggregate demand.
2. Resulting in high cost of resources adjustment.
3. Excessive reserves at banks may be declined absorbing the banks' ability of expanding loans. This may reflect as fall in monetary growth, deflationary process and recession.
4. The shock may leave the real side (GDP) with very less effects.

As for easing Reserves Requirements

1. Directly increase Banks' ability of expanding loans, which may cause inflationary pressures via growth of liquidity preference associated with less monetary growth.
2. additional supply of bank loans may encourage the Government to incur large deficits and may be on account of the private part of aggregate demand.
3. This shock may fail to bring real economic growth.
4. Planned Budget deficit can result in raising percentage of the government borrowing from the Banking system may reduce the current budget deficit and produce less inflationary process.

Monetization must be controlled via control of:

1. Banks' ability to expand loans.
2. Good perception by the BOS to changes occurs in Liquidity preference.
3. Sizing of Government borrowing.

Control of liquidity preference may be via control of Government fiscal decision concerning its borrowing from Banks to cover its deficits. That requires the avoidance of inflationary monetary policies. Wise Policies should be constructed to facilitate finance to the private productive sector. Moreover, it is necessary to avoid high liquidity preference and less monetary growth associated downward trend of money velocity Government borrowing must be rationed and Bank loans must be channeled to the productive real sectors. That requires developing real sources to finance the current budget deficit such as direct taxes, profits of public productive institutions and projects.

The process of monetization in Sudan depends directly on the available bank loans. The latter is determined by the volume of excess reserves held by banks, the Government budget deficits, and the demand for effective money liquidity by the public respectively. Thereby, money supply in Sudan is greatly an endogenous variable determined mainly by the demand for effective money liquidity by the public, with less significance by the general price level index. But its responsiveness to the growth in the trend of real output was insignificant.

The impact of loan expansion by the banking system on the macroeconomic level could be channeled through two main routes; the first, either directly by increasing the effective demand for liquid money. However, that may aggravate the inflationary process in the economy. Indirectly, that an increase in liquid money demand may be percept by the BOS. Accordingly, it may induce a monetary supply growth. That in turn, may raise the cost of resources adjustment. The overall of that process may end by pulling up the aggregate demand thus aggravate inflation in the economy. On the other hand, if the monetary growth associated with an inflationary process it may reduce the money supply in real terms and de-accelerate its velocity. Hence more, expectations of slowdowns in aggregate demand merges and a deflationary process began. That process may end with recessionary features in the economy. The second, Bank loans expansion also may encourage the Government to incur large deficits. That events also may strongly pull the aggregate demand. However, this financial expansion seems to commit less impact on the economic development (the GDP growth). The reason is that most of the banks loans devoted to finance the budget deficit were directed to the current expenditures.

It is basic that monetization in Sudan could be monitored through: control of banks ability to expand loans, good perception of the BOS to the growth in liquidity preference and the government good control and sizing of its borrowings to cover its budget deficits. Additionally, there are some factors play a serious role in growth of liquidity preferences. An example is the government decision of reducing its deficits through borrowing from banking system, the inflationary process rising from expansionary monetary policy and the disturbing of monetary growth. It is that rises the cost of resource adjustment in the economy and aggravates inflation. To avoid high liquidity preference policy must be designed to bring as possible, minimum inflationary process.

Financial expansion through bank loans often activates liquidity preference, encourage the government deficits, and feeds the inflationary process at last. It causes no effects on the real side of the economy. The policy here is to facilitate direct finance to enhance the private investment which could play a vital role in accumulating capital then enhancement of economic development.

That implicates if strong expansion of bank loans is associated with de-accelerated velocity i.e., a large liquidity preference, could produce lower monetary growth and a deflationary process. Moreover, the economy may suffer deep recession. The policy here is to monitor and rationed the government borrowing. Hence, the available bank loans is to be directed to the real productive sectors according to its priorities. That is to avoid declining of money velocity and recessionary features in the economy.

7. References

1. Abuobidia Abdel-Whab Fageer, The likely effects of devaluation of some key macro-variables. Experience of Sudan, M. Sc. U. K. 1997.
2. Dornbush, R. S. Macroeconomics fourth Edition 1997.
3. Ahmed, Mohammed Osman, Imad Mohammed, and Selah Eden El-Mahi (1998) The Causes of Cash outflow form the Banking System in Sudan. El Masrafi Journal, Vol. 16, Bank of Sudan, Research Department (in Arabic).
4. Ahmed, Sedahmed Mohammed (2000): "Evaluating Cash liquidity and Profitability of Sudanese Commercial Banks", a complementary dissertation submitted in partial fulfillment for M. Sc. Degree in Business Administration, Sudan University, (in Arabic).
5. Awad, M. H. (1995): An essay in Al-Masrafi, Quarterly Magazine, Vol. March 1995, Bank of Sudan.
6. Carlson, Keith (1989) Federal Budget Trends and the 1981 Reagan Economic Plan. Federal Reserve Bank of St. Louis Review.
7. Eggertsson, Gauti and Jonathan D. Ostry (2005) "Does Excess Liquidity Pose a Threat in Japan?" Policy Discussion Paper, April, Research Department, IMF, PDP/05/5.
8. Ngatani, K. (1978) The Monetary Theory, An Advanced Textbooks in economics; 10, 2nd ed., North Holland Publishing Co. Amsterdam, New York, Oxford.
9. Osman, Abdul Wahab (2000): The Economic Reform Methodology in Sudan, an analytical study for economic developments in Sudan during the period (1970-2000) Money Coinage Center, Khartoum, Sudan (in Arabic).
10. Patinkin, D. (1965) Money, Interest and Prices, New York, Harbor and Row.
11. Pesaran, M. Hashem and Richard J. Smith (1994) "A Generalized R^2 Criterion for Regression Method Estimated by the Instrumental Variables Method," *Econometrica*, 62 (May).
12. Pindyck, Robert S. and Daniel L. Rubinfeld (1998) *Econometric Models and Economic Forecasts*, 4th edition, McGraw-Hill.
13. Ramey, Valerie (1993) "How Important is the Credit Channeling the Transmission of Monetary Policy?" *Carnegie-Rochester Conference Series on Public Policy*, 39.
14. Saeed, Mohammed (2004) *The Developing Course of the Bank of Sudan: features, distinction and method*, Khadir Press, Khartoum.