CHAPTER EIGHT

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In this chapter, we shall analyse the effect of monetary expansion on the balance of payments (**BOPs**). We adopt the monetary approach to the balance of payments in analysing the impact of the monetary base to the external trade sector, in spite of its shortcomings, as it is the only approach that establishes a direct relationships between monetary disequalibruim and balance of payments. The first section hereinafter, introduces and discusses the balance of payments. The second section, surveys related economic literature. The third section deals with the balance of payments developments in the Sudan, while the fourth section is concerned with the components of balance of payments. Then, comes the fifth section, which studies foreign exchange rates and policies, and lastly, section six deals with modified estimtaing equations and their empirical results with regard of the behaviour of exports, imports and balance of payments.

8.1 INTRODUCTION

The principle tool for the analysis of the monetary aspects of international trade is the balance of payments statements. The balance of international payments or simply the balance of payments of a country is: *"...a systematic*

record of all economic transactions between residents of the reporting country and residents of foreign countries." [*Kindleberger, 1964; p. 456*],[1] of all international economic transactions of that country during a given period, usually, a year. It represents a classified record of all receipts on account of goods exported, services rendered and capital received by residents and payments made by them on account of goods imported and services received from the capital transferred to foreigners or the non-residents. In economic analysis, the term balance of payments is a very useful and meaningful concept. The balance of payments analysis shows how a country is paying its way internationally, whether paying for its imports and other current payments transactions by exporting goods, drawing down its foreign assets, accumulating foreign liabilities, or receiving donations. Thus, whether a country is borrowing or lending money, whether its currency and foreign exchange resources are becoming weaker or stronger, and the monetary and exchange control policies pursued as well as their effectiveness can be studied from the balance of payments of the country.

Balance of payments accounts also permits an appraisal of the effect of currency devaluation i.e. whether exports have increased to a considerable extent through devaluation or not can be easily seen from the current account section of the balance of payments. Above all, and more recently, with the development of national income accounting, the balance of payments account has been used to measure the influnence of foreign trade and transactions on the national income of the country, [*Kindleberger, 1964; p. 456*]. Baring oil-producing countries and rapidly industrialised countries e.g. Singapore, Hong Kong, South Korea and Taiwan all other developing countries are passing through severe **BOPs** problems which is mainly due to demand for imports

and slowly or creeping exports earnings, including the Sudan. The Sudan is primarily an agricultural country, agricultural sector counting for over one-third of the gross domestic product. Manufacturing and mining sector barely accounts for one-tenth of the **GDP**, mostly related to processing of agricultural products and recently the exploitation of oil. The rest, more than half of the **GDP** since 1980/81, came from the mushrooming services sector. A reasonably accurate presentation of the **BOPs** of the Sudan, that is the summary in money terms of transactions with the rest of the World, was hampered by what foreign economists considered understatements in official statistics of imports and public sector loans. In the Sudan, foreign trade counts for one-fourth of the **GDP** and where inflow of foreign capital has been a constant source of financing saving-investment and foreign exchange gaps. When there exists a sizeable tradeable sector and free mobility of capital, the effects of shocks generated by the monetary sector are not confined to domestic income and prices but impinge on the **BOPs** also through inflow/outflow of goods, services and capital. Availability of reliable statistical information was a problem obviously due to the effects of the economy's mismanagement, famine, political and social conflicts and civil war. In the next section, we will examine the theoretical and empirical literature of the balance of payments development.

8.2 RELATED ECONOMIC LITERATURE OF BALANCE OF PAYMENTS

Historically, various approaches have been developed for the balance of payments analysis. The classical price-specie-flow mechanism, the elasticity approach, the absorption approach, the Keynesian multiplier approach, the economic policy approach and the monetary approach, [*Johnson, 1977*].[2] The

Monetary approach to the balance of payments is a modern version of the classical price-specie-flow theory with a long tradition origin in the writings of the Classical School of economics, [*Frenkel and Johnson, 1976; pp. 32-33*],[3] and developed by David Hume (1952) [*Frenkel and Johnson, 1976; p.147*]. The proponents of this modern version like Johnson (1958, 1972, 1976 and 1977), Haha (1959) Mundek (1958,1971), Frenkel (1971), Mussa (1974, 1976) and the economists in the International Monetary Fund e.g. Polak (1957), Guitan (1973). The basic content of the monetary approach to the balance of payments is an essentially monetary phenomenon, in that the demand for and supply of money play a crucial role in its determinations:

> "*Consequently in analyzing the money account, or more familiarly the rate of increase or decrease in the country's international reserves, the monetary approach focuses on the determinants of the excess domestic flow demand for or supply of money*". [*Frenkel and Johnson, 1976; p. 21*].

The adjustment mechanism has outlined that an increase in the money supply leads to an increase in demand for goods, services, and securities in a country under fixed exchange rates system, increase in domestic demand leads to rise in real domestic prices and financial assets in the short-run relative to those in the foreign markets. So real domestic prices and financial assets will be substituted by foreign assets not only in the domestic markets but also in the foreign markets. All this will result in decline of exports and rise of imports due to a balance of payments deterioration. Some features of the monetary approach to the balance of payments are : (a) monetary approach is a macroeconomic in nature, i.e. the theory explains the overall balance of payments by focusing directly on the interaction of simple aggregate relationship, (b) surplus or deficit in the balance of payments is the outcome of disequilibrium in money market and is self-correcting, (c) demand for money

is a stock relation and variations in the supply of money relative to demand for it, which are associated with balance of payments equilibrium must work toward a stock equilibrium, (d) measures like devaluation, import control and tariffs have only transitory effects on the balance of payments and exchange rate changes only a substitute for changes in domestic credit which operate on the balance of payments through real balance "effects", (e) the theory is valid in the long run when the assumptions like equilibrium in money market, wage price flexibility and equilization of prices of traded goods in all countries are more applicable, and last the stock money is endogenous because it is linked with balance of payments of the country. Herein below, we would like to high light some of the studied works of economic writers that are related to the monetary approach and balance of payments.

Mahhouk and Drees (1964)[4] have studied the domestic policies and payments problems of the Sudan, during the period 1947-62. They stated that in between 1950 and 1962, the money supply rose by 89 % followed by a steep rise in bank credit to the private sector and a moderate increase in net foreigh assets. They observed that:

> *"...the money supply in the Sudan rose from 89 per cent. This followed from a steep rise in Bank credit to the private sector and moderate increase in foreign assets, only partly offset by a net improvement in the position of the government sector..."*

> Further they add: "*The impact on the money supply of the sharp fluctuations in the balance of payments has generally been neutralized by opposite changes in the fiscal position of the Government.*" [*Mahhouk and Drees, 1964; p. 159*]. Thus, they conclude that: *"few countries have experienced as sharp fluctauations in their foreign trade as did the Sudan...Fluctuations in the trade balance resulted in sharp variations in the exchange reserves and in fiscal position of the Government. Despite*

these sharp fluctuations, the rate of growth of the economy was highly satisfactory, as it is indicated by the growth in exports, imports, and GDP." [*Mahhouk and Drees, 1964; p. 172-174*].

Mussa (1976)[5] the purpose of his study is to set forth the general principles which characterize 'monetary approach' to balance of payments analysis and to illustate how these principles are applied in a simple mode of trade and payments behaviour and he has argued that:

> "*Capital mobility, nontraded goods, sticky prices inventory accumulation, 'disequilibrium' behavior, growth and many othe issues remain for future research. But none of these complications will provide any escape from the essentially monetary character of the balance of payments, or from the central role which demand function and the supply of money process must play in balance of payments analysis, 'particularly in the long-run.* [*Mussa, 1976; pp. 220-221*].

If a country adopts commercial policy instruments like tariffs, quotas exchange rate control etc. this reduces the volume of imports below its free market level.

Guitian (1976)[6] provides an empirical study of the Spanish economic during 1955-1971. His tests were intended to determine the effect of domestic credit expansion on the balance account and overall balance of payments and the connection between external accounts and the variables of gross domestic product, domestic and foreign prices and the rate of domestic credit expansion. He concluded that:

> *"...Spanish devaluations had different effects on the balance of payments...The tests appear to establish domestic credit expansion as the major determinant of the evolution of the balance of payments...The experience of the Spanish economy during this period supports the view that exchange rate changes are not effective unless accompanied by appropriate credit policies"* [*Guitian, 1976; p 355*].

Thus, his findings were that of the control of bank rate by monetary authority may enable attainment of desired international stock of reserves for any given demand for money.

De Silva (1977)[7] has established a model which based on Monetarists approach to inflation, in which he has stdudied money supply, inflation and balance of payments in Sri Lanka 1959-1974. He has reported that his findings as highly tentative due to its obvious weaknesses, and he concludes that money supply has extiorted a significant influence on recent inflation. He stated that:

> *"Finally, this study is unable to contribute very much to our understanding of the unfavourable effect of inflation on export. Although our finding in this respect is negative, further research is necessary before we could reach definite conclusion."* [*De Silva, 1977; p.34*].

Blejer (1977)[8] has developed a model for a short run dynamics of prices and the balance of payments in Mexico during the period 1950–1973, and concluded that:

> *"The country's balance of payments performance is also well explained by the independent monetary variable. The lag structure indicates that a stock disequilibrium in the money market will create a flow process of adjustment in the balance of payments that will have relevant effect during a period of about three years. The 1954 devaluation of the Mexican currancy had an effect on the rate of inflation and on the inflow of reserves during the same years, but these effects became insignificant after a period of one year."* [*Blejer, 1977; p. 427*].

Bhatia (1982)[9] has studied the monetary theory of balance of payments in the case of India during the period 1951-73 and found that when the prices rise, there is an increase in the stock demand for money balance and it the

increase in demand is not met from domestic component of money stock i.e. domestic credit the same is met from foreign assets by deposing goods services and securities in the international market and causing a balance of payments surplus or a reduction in defict. This hypothesis is, however in contrast to the money supply theory which states that balance of payments fluctuations has a monetary implication as it changes the stock of high-powered money.

8.3 BALANCE OF PAYMENTS DEVELOPMENT

The impact of monetary expansion on income and prices was discussed in a closed economy framework. But the closed economy assumption is not strictly applicable to the Sudan, as clearly seen from the fact that foreign trade accounts for almost half of the **GDP**, and inflow of foreign capital has been a constant source of financing saving-investment and foreign exchange gaps. Thus, due to large deficit in the current account, the overall balance of payment remains weak. Medium-and-long-term official capital inflows are weak due to external debt arrears, civil war and regional conflicts. Despite various measurers taken by the Government of the Sudan (**GoS**) since the late 1970s, the external balances of the Sudan continued to worsen. The trade balance ratio stood at negative 6.0% of **GDP** during the period 1980/81 to 1984/85, meanwhile it has shown a positive sign and registered 3.9% and 2.4% of the **GDP** in the years 2000 and 2001. The current account deficit ratio started becoming negative to 1.7% of **GDP** in 1980/81 to 1984/85, and reached negative 4.9% and negative 7.9% respectively in the year 2000 and 2001; the deterioration of the current account has to a large degree been a reflection of deficit domestic resources mobilisation. The decline of investment

has only been partially offset by increase in private transfers by these Sudanese nationals who are working abroad (brain drain). The Sudan's access to financing and project aid is low, limited concessional lenders mainly from the Gulf Arabian countries. Principal payments on external debt are negligible, and the counrty continues to accumulate arrears. There was a substantial increase in foreign direct investments (**FDI**) in connection with constructing of a pipeline. In the year 1998, foreign direct investments soared to about US $ 371 million, up from about US $ 98 million in 1997. During 2001 foreign direct investments continued to increase, and was estimated to about US $ 574 million. The shock generated by monetary sector are not confined to domestic income and prices but, impinge on the **BOPs** also through inflow/outflow of goods, services and capital. The structure of the Sudan's **BOPs** is heavily, weighted with commodity traded, more than 55 percent of the Sudan's current account exchange receipts and payments. The foreign transactions revealed a change in the balance of payments position, from a surplus situation of US $ 111.5 million in the year 1999 and US $ 165.4 million in the fiscal year 2000, the balance of payments has shown a deficit of US $ 70.26 million in the fiscal year ending December 2001.[10]

It can be noted that the data of the balance of payments of the year 2000 contained and estimated errors and omission (including private investment) of about US$ 354.93 million in the year 2000, this figure dropped to negative US$ 65.84 million in 2001, which greatly affected the balance of payments position. It is worth mentioning that the marked improvement in recording direct investment data led to the lowering of the errors and omissions item mentioned above. The deficit in question was led by a rise in the current accounts deficit from US$ 517.58 million to US$ 518.84 million, i.e. 0.2%

increase. The current account deficit resulted form a fall in the surplus of the trade balance from US$ 440.29 million to US$ 303.5 million, and equivalent of 31%. Whereas, the services, income and transfers account showed a decline of the deficit from US$ 957.87 million to US$ 822.34 million (14%) decrease form 2000 to 2001. On the other hand, the Capital Account surplus increased from US$ 328.06 million to US$ 514.43 million, a 56.81% increase. As a result of these developments, the overall current and the Capital Account balance surplus dropped from US$ 165.40 million (including unclassified receipts) to US$ 70.26 million. Table (8-2) shows details of the balance of repayments for 2000-2001, while figure (8-1) is a graphical demonstration of the balance of payments for the same period 1980/81-2001.

8.4 Components of Balance of Payments

8.4.1 Current Account Consists of the visible transactions i.e. exports and imports of commodity, in addition to the services account, income and current transfers (invisible transactions).

(A) Visible Transactions: The current account has shown a deficit of US$ 1387.20 million at the end of the fiscal year 2001, as compared to the fiscal year 2000; wherein, the deficit was only US$ 517.58 million, the deficit resulted from a fall in the surplus of the trade balance from 440.29 million to US$ 303.5 million (31.1%). That was attributed to the decrease in merchandise exports by 6% and increase in imports by 2.1%. It is worth mentioning that the fall in the exports proceeds was due to considerable decline in agricultural and animal products exports proceeds of 29.4% especially livestock and meat. In the meantime there was increase in private

sector imports of about 5.9% and a decline in the Government import by about 27.9%, resulting from decrease in imports of raw materials, machinery, equipments and manufactured goods.

(B) Invisible Transactions: In the invisible transactions part, whereas the services, income and transfers accounts showed a decline of the deficit from US$ 957.87 million to US$ 822.34 million (14.1%). That is mainly attributed to the increase of invisible receipts from US$ 722.28 million to US$ 859.25 million, i.e. 18.9%. Invisible payments registered a slight increase from US$ 1680.15 million to US$ 1681.59 million. The receipts increase was attributed to growth in private sector payments from US$ 638.2 million to US$ 730.48 million, a 14.4% increase. Government transfers increased from US$ 51.99 million to US$ 96.33 million (85.3%) within the current transfers' item. Increase within income account from US$ 2.65 million to US$ 9.22 million was due to rise in employee's compensations, and the investment returns from US$ 1.93 million to US$ 8.55 million. At the same time, within the receipts the services account fell sharply from US$ 27.51 million to US$ 14.67 million due to a decrease in transport collections, which fell from US$ 15.19 million to US$ 6.12 million, and a fall in the travel receipts from US$ 5.42 million to US$ 3.12 million

8.4.2 Capital Account

The net capital inflows rose sharply by 56.8%, from US$ 328.06 million to US$ 514.43 million between 2000 and 2001, as shown in Table (9-5). This resulted from the surge in total inflows from US$ 481.47 million to US$ 661.27 million, a 37.3% increase on one hand, and a decrease in the total

repayments from US$ 153.41 million to US$ 146.84 million, a 4.3% decreases on the other hand. Most of the increase in inflows was due to direct investment; from US$ 392.21 million to US$ 574 million, i.e. a 46.4% increase, and also due to government drawings from US$ 16.46 million to US$ 21.84 million, a 32.7% increase. Meanwhile, net short-term capital investments decreased from US$ 72.8 million to US$ 62.76 million (13.8%). Government loans, included drawings from Islamic Development Bank for US$ 16.13 million, **IFAD** for US$ 2.98 million, the **OPEC** Fund for US$ 2.98 million, the **OPEC** Fund for US$ 2.61 million, and Abu Dhabi Fund for US$ 0.12 million. The government repayment of loans decreased from US$ 135.85 million in 2000 to US$ 105.18 million in 2001 i.e. by 22.6%. Such repayments included US$ 49.50 million to the **IMF,** the US$ 12.55 million to the Islamic Development Bank, US$ 12 million to the Arab Fund for Economic and Social Development, US$ 9 million to the OPEC Fund, US$ 5.33 million to the Saudi Fund, US$ 2.84 million to Turkey, US$ 1.57 million to **IFAD**, and US$ 1 million to the World Bank. The direct investment net inflows increased from US 392.21 million in 2000 to US$ 574 million in 2001 (including Machineries and equipments) i.e. 46.3% rise. The other investment outflows amounted of US$ 17.56 million in 2000. The inflows into the country, dropped from US$ 72.80million in 2000 to US$ 21.1 million (71%) in 2001.

8.4.3 Foreign Exchange Reserves (FER)

Table 8:3 shows the factors affecting foreign exchange reserves. During the year 2000 the net foreign exchange reserves were US $ 108 million. This was attributed to surplus in both the current and the capital accounts. It fell to

minus US $ 127.6 million in 2001, this decline was due to deficit realised in current and capital accounts by almost US $ 70.26 million.

Table No. 8:1 Factors Affecting Foreign Exchange Reserves 2000-2001

(US$ million)

		2000	2001
A –	Current and Capital Account s	165.4	-70.26
B –	Commercial Banks (Net Foreign Liabilities)	-29.8	-77.04
C –	Bank of Sudan (Short-term liabilities)	-26.6	40.54
D –	Bilateral Payments Agreements (Net)	-01.0	-20.84
E –	Net Change of Foreign Reserve in convertible currencies : (A+B+C+D)	**108**	**-127.6**

Source: Bank of Sudan

8.5.1 FOREIGN EXCHANGE RATES AND POLICIES

When a country enters the area of foreign trade the question of payments arises since both to make payment or to receive it in different currencies. This type of transaction involves foreign exchange. Exchange rate obviously is refereed to the external value of domestic currency. In the Sudan, the exchange rate system has undergone fundamental changes during the 1990s coinciding with the liberalisation and economic reforms. The effect of exchange rate on trade balance, balance of payments and exports competitiveness has remained controversial. Foreign exchange markets, rates and policies are influenced by numerous factors such as exports, imports, investment, disinvestments, anticipation of increase or decrease in reserves, international payments deficits and stability of government. A deficit or surplus of certain segments in the balance of payments may also help to explain the level of exchange rates as desequilibrium indicates the level of

demand and supply of foreign currencies. Deficit increases the demand of foreign exchange. This reduces, all other things being the same, the value of national currency on the exchange market.

A survey of related literature reveals the fact that attempts made to examine the influence of balance of payments, external debt management, foreign exchange rate seem to be scattered and very rare. Some empirical works examine the validity of purchasing power parity theory (**PPP**) in explaining the determination for exchange rate under fixed and flexible exchange rates systems, but few works have been carried in relation to less developed counties. There is an argument that the flexible exchange rate era has introduced unnecessary and harmful volatility into exchange rates after the breakdown of the **IMF** exchange regimes during the 1970s and the emergence of floating rates attracted the economic writers, their studies appraised that the floating exchange rate system is useful to developed as well as the developing countries. But their discussion reveals that the actual experience of non-oil exporting developing countries is that, the floating exchange rates are characterized by large fluctuations in both their nominal and real exchange rates. Several theoretical as well as empirical studies that related to foreign exchange rate and policy that concentrate on the nexus between exchange rate and its impact on foreign trade and **BOPs** were done by so many economic writers such as; the studies of Crockettt and Nsouli (1977),[11] Dreyer(1978),[12] Heller (1978),[13] Wickham (1985),[14] Subarna (1998),[15] and others examined the applicability of floating rates particularly towards the less developed countries and stated that to resolve the problems of these countries the floating are not competent.

The empirical study that has been done by Crockett and Nsouli (1977) has examined the considerations to be taken into account by developing countries in determining their policy response to the current situation of floating exchange rates. Their paper examines the criteria which should govern the choice of exchange regime by a developing country. While they have given attention to the classic choice between fixed and flexible exchange rates and they also brought out the fact that the meaning of a fixed rate is complex today in view of the movement of exchange rates between the major currencies. This gives rise to the very important problem of what currency or currencies a particular country should use as a basis for pegging its exchange rate. In their analysis of the implication of opting for a fully flexible exchange rate system, Crockett and Nsouli make the point that such a system is to give reasonable stability of the exchange rate in the short-term there needs to be a well-developed exchange market dealing in both spot and forward positions. In their words:

> "*For flexible exchange rates to be stable without government intervention, a well functioning foreign exchange market is virtually non-exististent in most less developed countries, their is certainly a danger that, if less developed countries were to float, the private institutional structure would be unable at least initially to dampen satisfactorily exchange rate fluctuations.*" [*Crockett and Nsouli, 1977; p.138*].

Dreyer (1978) and **Heller** (1978) separately have used a varity of statistical techniques with cross-section data to test the hypothesis that the choice of regime has been determined by the consideration advanced in theoretical analysis. An important problem faced in these studies is the difficulty in giving numerical values to different exchange regimes.

Wickham's (1985) study focuses from the issue of floating and feasibility to the questions of whether some degree of exchange rate flexibility is necessary to desireable for developing countries. The subject of exchange rate management, including flexibility in pegged rates, leads to a review of the considerations that are relevant in determining how a developing country should choose a pegging exchange rate when the currencies of industrial countries are floating against one another. The study concluded with examination of empirical work on choice of exchange rate, stating:

> "*Independent floating is often considered flexible for many developing countries because of the underdevelopment of domestic financial markets... Moreover, ruling out some form of "clean" or "managed" floating does not remove the possibility of adopting other type of flexible exchange rate arrangement.*" [*Wickham, 1985; p. 285*].

The empirical findings of Hussain and Thirlwall (1984-1986)[16] who show that because of Sudan's low export supply elasticity and inelastic imports demand exchange rate devaluation has at best been neutral in its effect on balance of trade. While **Elbadawi (1992)**[17] has used a simple general equilibrium model to derive a forward-looking linear solution of the premium on the black market for foreign exchange in the Sudan. He hypothesised that successful exchange rate unification and subsequent integration of parallel market into the Sudan's regular economy will required deep fiscal reform and liberalization of foreign trade and exchange rate policies tailored to the pace of macroeconomic reform. The results of his model show that controlling inflation becomes more difficult under high-premium regimes and that hurts official exports and tax revenue from foreign trade. A high-premium also tends to accelerate capital flight. He observed that:

> "*Therefore, the main conclusion that came out of this analysis is that the lack of strong commitment to fiscal retrenchment has been the main*

cause behind the failure of economic reform in the Sudan ... Therefore, in addition to other reforms in key areas such as the financial system and investment policy, the foreign trade and exchange rate stabilization program will play an equally important role in effecting the much needed transition from adjustment to growth." [*Elbadawi, 1992; pp. 44-48*].

The foresaid discussion reveals that there ae specific **BOPs** problems in less developed countries which are caused by the internal and external factors. Hence, majority of less developed countries are in dire need to undertake trade reforms and other economical measures that expand the productivity capacity and improve the efficiency. Here, an attempt is made in this section to study the foreign exchange rates and policies in the Sudan.

In order to finance the deficit, foreign exchange reserves decrease. According to International Monetary Fund (**IMF**), the Sudan has foreign exchange reserves that were equivalent to only two months' import by the end of 2001. This is extremely weak reserve for a commodity-development developing country. Whereas, Trescott (1971)[18] explains it as:

"Accumulation of official foreign assets was not simply a passive response to autonomous forces. There was policy influence as well, particularly relating to the foreign exchange rate." [*Trescott, 1971; p. 153*].

During the period of this case study 1980/81–2001, the Sudan maintained a system of multiple–exchange rates. The assumption that there is preventing a fixed exchange rate regime in the Sudan was only partially true, but the rate with respect to convertible key currencies of the world have been fluctuating throughout 1980s and 1990s. The official exchange rates, as well, at the same time, a free exchange rate was permitted to exist in the late 1980s and through out 1990s; it valued the Sudanese pound substantially below the official rate of exchange. From 1980/81 the official rates were LS 0.56 to the

US $ one, which reached SDD 258.70 per US $ in the of 2001, free market rates centred around LS 9.50 to US $ one in the year 1988/89, meanwhile black market foreign exchange was more than both, the official as well the free market. Most import purchases had to be made at the free rate, except when **BoS** sales at preferred rates for preferred imports and other transactions.

8.5.2 FOREIGN EXCHANGE REFORMS

Market and price reforms focused on abolishing controls and deregulating trade and investment. The first devaluation of the Sudanese Pound (**LS**) was in the year 1978 involved a fourteen percent correction of the exchange rate relative to the US dollar; this was followed by several other devaluations, but they all failed to correct the overvaluation of the Sudanese pound and later on the Sudanese dinar. Lack of supporting financial policies, ineffective monetary instruments and luck of foreign exchange reserves undermined exchange rate reforms. The real exchange rate tended to appreciate because of weak demand management and persistent inflationary pressure; thus a wide spread persisted in the official exchange rate relative to the parallel market rate. The reforms began to reduce the wide spread gap in between the official and parallel rates in the late 1980s and early 1990s, though the spread persisted until the end of the 1990s decade.

In the year 1998, a more comprehensive strategy for exchange rate reform was introduced. Oil-related inflow of foreign currency has contributed to a stable exchange rate, but **BoS** has also intervened heavily in the foreign

exchange market so as to keep its currency stable. As a result, the real exchange rate appreciated significantly while foreign reserves declined. In light of the low level of foreign reserves, and in order to strengthen competitiveness, the foreign exchange policy has recently been revised from a de facto fixed exchange rate to a managed float with a wider band length. Still there are many geographical areas outside the government control (Western, Southern, and Eastern borders), varieties of foreign currencies (US dollar, Ugandan and Kenyan shillings and Ethiopian Birr) along with the ceased Sudanese pound plus the Sudanese Dinar, thus all these currencies operating under different exchange rates according to the demand and supply far away from the central monitory authorities.

8.6 ESTIMATING MODELS FOR THE ANALYSIS

The empirical work of this chapter that is related to **BOPs** is utilising the annual data for the period 1980/81-2001. The overall balance of payments, as represented by the proportionate change in the stock of international reserves in terms of domestic currency, is specified as a positive function of the excess demand for nominal money balance and a negative function of the deviation of the domestic price level from its **PPP** [*Khan and Knight, 1981; p.9*].[19] Hence, we take the analysis of the exports behaviour, imports behaviour and the estimating equation to **BOPs** in case of the Sudan.

8.6.1 EXPORT BEHAVIOUR

There is strong influence on foreign assets holding of **BoS**. The overall growth of the economy decides the volume and nature of exports. It is necessary to

discuss the role of exports in the context of the Sudanese economic growth; the **GDP** best reflects the economic growth of the Sudan. As the economy grows, the total output increases with widening of the economy's manufacturing base. The development encourages exports, in the year 1980/81 exports registered only eight per cent of the **GDP**, and they remained at about the same level in the following years. Adverse external factors were part of the cause; the prices for cotton and groundnut, two of the major exports crops, fell by about 30%. But declining prices explain only part of poor export performance. Five agricultural commodities (cotton, sesame, sorghum, oilseeds and livestock) constitute more than 75% of exports. During the period of our study, exports registered its lowest ratio to **GDP**, 1.9% and 2.2% from 1985/86 to 1994/95, but there was substantial increase in the ratio, 16.1% and 13.6% in 2000 and 2001 respectively, which was attributed to export of oil. Exports are also affected by imports, as many export items contain imported inputs. Capital goods are essential imports that ultimately contribute to the Sudan's **GDP**. Invisible trade in the form of availability of transport insurance services, financial service, personal, cultural and recreational services etc. influencing the value and volume of exports. Wholesale or consumer price indices depicting inflation in the Sudan are important factors influencing exports. Domestic inflation increases the price of exported goods. High inflation rate adversely affects exports, unless it is adjusted through exchange rate management. It is not a hidden story that the exchange rate is deteriorated in the Sudan. With a view to the foresaid consideration, export function may be specified as follows:

$$EXP = f(GDP, IMP, CPI, EXP)$$

Where, **EXP** stands for exports, **GDP** stands for Gross Domestic Product, **IMP** stands for imports, **CPI** is for consumer price index, and **EXR** stands for

foreign exchange rate. Hence, we posit a small open economy macroeconomic model. Which includes imports, exports and the **BOPs**, the model estimated equation for exports is set out as follows:

$$log\ EXP_t = a_0 + a_1\ Y_t + a_2\ IMP_t + a_3\ EXR_t + a_4\ P_t + e_t \qquad (1)$$

All variables are expressed in logarithms where the quantity variables are expressed in logarithms values. Where, $\mathbf{EXP_t}$ denotes exports, **Y (GDP)** stands for income, **EXR** stands for foreign exchange rate, and **CPI** is comsumer price index.

8.6.2 IMPORTS BEHAVIOUR

The Sudan naturally, has a plenty of resources, but needs technology when it started on the path of economic development. As it may be pointed out that a less-developed country i.e. the Sudan, with planned programmes has a greater propensity to import, essential capital and consumer goods had to be imported in large quantities. In years of famine and draught which hit the country in the 1980s, food grains too had to be imported. Imported materials are essential for development, but with economic growth the rate of imports must gradually come down. In the Sudan, the imports kept rising over years, widening the current account deficit. The volume and value of imports are influenced by the **GDP,** which has both negative and positive relation with imports. Rise in **GDP** implies rise in income, with increase in income, demand for imported goods increases. The **GDP** affects imports both ways, as economic development progresses, the composition of imports shifts from capital goods to consumer goods. Invisible services also influence imports

though are mostly indirect. Imports stand at 23% of the **GDP** in 1980/81 and 1981/82, thereby exacerbating the effect of drastic fall in exports. The major increase occurred in food and other consumer goods, along with the petroleum products. The ratio of the five to one between imports and exports that prevailed in 1981/82 was clearly unsustainable. We observe that imports ratio to **GDP** also registered the lowest average during the period of our study and stood at 4.0% and 4.4% in 198/86 to 1989/90 and 1990/91 to 1994/95 respectively. While the government policies are directly focused on increasing exports, further efforts will be needed to constrain the future growth in imports, while at the same time increasing the share of productive imports is needed to support economic recovery. Recognizing that the exchange rate cannot bear the whole burden of this adjustment, the government needs to complement this policy instrument with others in order to facilitate the long-run objective of external balance. Imports of professional, technical knowledge may in the long-run reduce merchandise imports, and the import of services raises the total value of the country's imports.

The domestic inflation (cost-push) makes imported goods cheaper than domestic goods. The foreign exchange rate determines the value of goods in international market. Devaluation of the home currency discourages imports by making them dearer and appreciated home currency makes imports cheaper. The earning from the exported goods can not finance the entire amount of imported goods and services; there must be sufficient foreign exchange reserve to finance the deficit. Hence, import function may be stated as follows:

$$IMP = f(GDP, CPI, EXP, FER),$$

Where **FER** stands for foreign exchange reserve and other variables are defined as before. The specification of a model equation which is concerned with policy analysis of imports in the Sudan case should be simple as possible and consistent with the availability of data, with proper modifications the model equation for import is set out as follows:

$$log\ IMP_t = a_6 + a_7 Y_t + a_8 P_t + a_9 FER_t + a_{10} EXP_t + e_{2t} \quad (2)$$

Where, **F** is the net capital inflow, other variables are defined as above.

8.6.3 BALANCE OF PAYMENTS

The **BOPs** deficit or surplus is defined as the sum total of the current account deficit or surplus and capital account deficit or surplus, where the latter is inclusive of errors and omissions component of the balance of payments. Accordingly the fundamnetal **BOPs** equation is defined as: **BOPs** defcict equals current account deficit plus capital account deficit. Alternatively, the **BOPs** deficit is given by the decrease in the official reserves account. Obviously, the sum of **BOPs** (deficit or surplus) and change in the official reserves account necessarly equals zero. [*Gupta, G.S. 2000*].[20] the relationship between **BOPs** and money supply and their role in economic growth is explained by the following an estimating equation. The model for the balance of payments is adapted from Khan and Knight 1981 work's on the set out as follows:

$$\Delta\ log\ R_t = Y_1 [\beta_1 + Y_4 log Y_t - Y_5 P^e{}_t - log M_{t-1} + log P_t] - Y_2 [log P_{t-1} - log (\epsilon_{t-1} \cdot P_{ft-1}) - \beta_0] + \Delta\ log \epsilon \quad (3)$$

Where, $\triangle$ **log** R_t denotes the growth of international reserves, Y is real income, **M** nominal stock of money currency. **P** is domestic price level. P_f is foreign price index. Y_4 is the income elasticity of the demand for money. $\triangle$ **log**$\in$ is the proportionate rates of change in the exchange rate, β, **Y** and Y_5 P^e_t parameters are expected to be positive, P^e is expected rate of inflation β_O represents the equilibrium ratio of domestic prices to prices in the rest of the world.

8.6.4 EXTERNAL DEBT

Debt adversely affects the exports too, by effecting exports prices. An increased debt pressure by creating an increased urge to expand exports (at any price) led to higher percentage decline in the unit value of exports of less-developed counties; foreign debt implies capital inflow. This may lead to an appreciation of domestic currency against international currencies a deficit in current causes an increase in the country's external debt. This will have a negative effect on external value of the domestic currency. Since most of the foreign debt are denominate in the US$, a depreciation of home currency against the US $ will increase the external debt servicing burden and vice-versa. Here, we apply the following co-integration model to explore the dynamics between foreign debt and exchange rate in the Sudan; as follows:

$$log\ EXR_t = a_o + a_1 + Z_t \qquad (4)$$

$$log\ EXD_t = a_2 + a_3\ ER_t + e_t \qquad (5)$$

Where, EXR_t stands for exchange rate, EXD_t stands for external debt Z_t and e_t stand for the stochastic error terms.

8.6.5 RESULTS OF THE ANALYSIS

We report the statistical resulrt of the exports, import and the external debt only, as follows:

(a) **Export**

log Exp = **XR -1.00794 + INF .02439 + Y . 05767 + P 1.76168**
(-.373) (.113) (.264) (.655)
R^2 = .47849 F = 3.67003 Significance F = .0264

DW = 1.43646

(b) **Debt**

log Debt = **XR .76942**
(5.251)
R^2 = 59202 F = 27.57073 Significance F = .000

DW = 1.15930

(c) **Reserve**

log DRR = **P 1.103853 + INE – 044644 + Y - . 248759 + M – 1.44603**
(1.470) (.194) (-.935) (-1.886)
R^2 = .42196 F = 2.73741 Significance F = .0683

DW = 2.36325

The reporting results of the above regressions estimates, we typically reproduce the **t** value for each individual regression coefficient in part theses individual below it. The equation data quite well as indicated by the values of **R2, F** and **DW**. The above regression results strongly suggest that the there is positive correlation among the variables, with significant at 5%, and DW at around 2.

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Table No.: 8.2

Balance of Payments, During 1980/81 – 2001

(US $ million)

Item	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
Current Account Balance	-639.8	-248.6	-219.5	25.3	154.9	-17.4	-232.4	-358.0	-151.9	-372.2	-954.7
Exports	792.7	400.9	514.2	519.0	444.2	326.8	265.0	427.0	542.7	326.5	302.5
Imports	-1,633.6	-750.2	-703.2	-599.8	-579.0	-633.7	-694.8	-948.5	-1,051.0	-648.8	-1,138.2
Trade of Trade (net)	-840.9	-349.3	-188.9	-80.8	-134.8	-306.9	-429.8	-521.5	-508.3	-322.3	835.7
Capital Account (net)	8.3	0.6	-0.3	-----	------	-----	-----	------	-----	-----	------
Financial Account (net)	228.8	34.0	-148.8	-153.0	-443.9	-86.2	85.8	67.5	117.8	116.9	584.1
Net Errors and Omissions	14.7	12.6	145.5	-1.4	-126.0	-88.5	-196.5	3.1	-160.3	10.9	97.9
Monetary Movements	-----	-----	------	------	--------	-----	-----	------	-----	-----	------
Overall Balance	-396.4	-201.9	-222.8	-118.0	-420.9	-201.0	-343.0	-287.4	-192.8	244.4	-272.8
Reserve Assets (-increase)	-199.2	-136.5	34.5	-0.6	5.0	-46.3	46.3	-0.4	-3.8	4.5	3.8

Source: (1) IFS (IMF). (Data from 1980/81 to 1991/92).
(2) Bank of Sudan Annual Reports (data from1992/93-2001).

Table No.: 8.2 (Cont.).

Balance of Payments, During 1980/81 – 2001

(US $ million)

Item	1991/92	1992/93	1993/94	1994/95	1996	1997	1998	1999	2000	2001
Current Account Balance	-506.2	-456.7	-546.7	-576.2	-873.0	-828.3	-957.4	-431.41	-517.58	-518.84
Exports	213.4	417.3	535.6	555.7	620.3	594.2	595.7	780.10	1,806.70	1,698.70
Imports	-810.2	-944.9	-1,095.5	-1,184.8	-1,504.5	-1,421.9	-1,732.2	-1,256.20	-1,366.41	-1,395.20
Trade of Trade (net)	596.8	-527.6	559.9	-629.1	-884.2	-827.7	-1,136.33	-476.10	440.29	303.50
Capital Account (net)	-------	186.6	226.1	391.5	90.1	182.7	-379.1	-414.8	-328.06	-514.42
Financial Account (net)	316.4	326.6	276.0	373.7	136.8	195.0	333.4	435.3	431.6	562.1
Net Errors and Omissions*	31.0	232.4	338.5	177.6	- 719.0	608.4	603.4	128.1	354.93	-65.84
Monetary Movements	------	37.7	-17.9	7.1	63.9	36.2	- 25.1	- 111.5	- 165.40	70.26
Overall Balance	-158.8	41.8	19.1	63.1	37.5	18.1	73.2	114.8	123.9	-150.9
Reserve Assets (- increase)	29.3	- 41.8	-19.1	- 23.6	- 2.0	24.0	-16	-110.0	-108.0	127.6

(*) Including Private Investment From 1999 to 2001.

Source: (1) IFS (IMF). (Data from 1980/81 to 1991/92).

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