Chapter FOUR

SUPPLY OF FINANCIAL ASSETS

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This chapter deals with the supply aspect of financial assets .These assets can be classified into highly liquid financial assets and less liquid financial assets. Currency issued by the central bank of the country and demand deposits, time and savings deposits are the kinds of liquid claims issued by commercial banks. Less liquid claims are ones issued by non financial sector or real sector, such as equity shares, debentures etc. All these liquid claims are included in the broad measure of money stock in many countries. Factors influencing supply of such liquid claims are therefore, the same as those influencing money supply. Thus the modern approach to analysis of money supply can be used to explain supply side of these liquid claims on banking system.

Other claims are issued by public authorities. Government issues less liquid claims in form of treasury bills, bonds and other securities. It is a well known fact that both in developed and developing countries, government finances its large deficit by issuing such claims. These claims are being held by banking system and other institutional investors of the country concerned. Supply of liquid claims needs some explanation in terms of fiscal operations and related variables, which will be attempted subsequently in this chapter. In the first place, we would like to present theoretical framework which incorporates all the relevant factors influencing supply of liquid claims issued by the banking system.

Monetarists in general argue that the monetary authorities can exercise effective control over the stock of money. Others, especially those who share the new view of monetary theory, argue that the determination of the stock of money is part of simultaneous solutions for all the variables in financial and real sectors of the economy. In this view, the stock of money is determined, not only by the policy actions of monetary authorities, but also by the behaviour of public in various assets and commodity markets. It is not subject to close control by the monetary authorities. Monetarists do not necessarily deny that both real and financial sectors influence the stock of money (liquid assets) rather. Their argument is that the behaviour patterns of public and the banking system are stable and predictable enough to permit the monetary authorities to control the stock of money. The issue between monetarists and non monetarists is therefore an emperical one.

The question is related primarily to the specification and stability of the supply function for highly liquid assets (included in money stock measurement) and may be further illustrated by the following equations:

$$M = D_1 + C \quad \ldots\ldots (1)$$

$$RM = R + C \quad \ldots\ldots (2)$$

$$R = R\,(D_1 + D_2) \quad \ldots\ldots (3)$$

$$C = K\,D_1 \quad \ldots\ldots (4)$$

$$D2 = t(D_1) \quad \ldots\ldots (5)$$

Where : M = Total money stock.

D_1 = Demand deposits of banks.

D_2 = Time deposits of banks.

RM = Monetary base or High powered money.

R = Commercial banks reserves.

C = Currency held by non-bank public.

By substituting equation (3) and (4) into equation (2),

we obtain equation (6).

$$RM = r(D_1 + D_2) + KD_1 \quad \ldots\ldots\ldots\ldots (6)$$

Substitutating equation (5) into (6) we get equation (7)

$$RM = r(D_1 + tD_1) + KD_1 \quad \ldots\ldots\ldots\ldots (7)$$

Equation (7) can be rearranged as -

$$RM = [r(1 + t) + K] + D_1 \quad \ldots\ldots\ldots\ldots (8)$$

Monetary base is defined in terms of demand deposits in equation (8). D_1 can also be defined in terms of monetary base as :

$$D_1 = \frac{1}{[r(1+t) + K]} \; RM \quad \ldots\ldots\ldots\ldots (9)$$

Let us redefine equation (4)

$$C = \frac{K}{[r(1+t) + K]} \quad \ldots\ldots\ldots\ldots (10)$$

We have defined D, and C which are the components of money stock.

$$M = \frac{1 + K}{[r(1+t) + K]} \; RM \quad \ldots\ldots\ldots\ldots (11)$$

OR

$$M = mRM$$

Where: m = Money multiplier, and

RM = Monetary base.

Equation (11) and constructs of this general form are often defined as the supply function of money or liquid assets. Note that equation (II) is not a supply function for money but it gives us an equilibrium condition specifying that the total demand for currency and bank reserves equate the total quantity outstanding.[1] Note also that equation (11) enables us to identify all the relevant factors influencing multiplier (m) and monetary base (RM). Thus factors influencing multiplier are various behavioural ratios such as K, t, and r. Where K is the fraction of demand deposits which public would like to hold in currency form. t, refers to a fraction of demand deposits which is held in the form of time deposits, and r, represents a fraction of total deposits held by banks as reserves.

These various ratios themselves are influenced by other variables. But over a period, we observe greater stability in their behaviour. In Jordan's economy, currency and reserves ratios have become stable. This is also reflected in the stability of multiplier.

By rearranging the central bank balance sheet and certain selected items therin, we can express monetary base as under.

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(1) Gramley, Lyle E. and Samuel B. Chase, Jr., "Time Deposits in Monetary Analysis", Federal Reserve Bulletin, Vol. 51. (1969) *and see also* Dewald, W. W. and D. W. Lindsey, "A Critique of Structural Money Supply Models" Division for Economic Research, Ohio State University, Report 7216 (March, 1972).

RM = Financial Assets-Net Non-Monetary Liabilities (NNML) of the central monetary authorities.

The active financial assets of the monetary authorities are :

(1) Credit to the government by banking system.

(2) Credit to private sector.

(3) Credit to foreign sector given by banking system and ;

(4) Miscellaneous assets.

Component of NNML are paid up capital and reserves, cash balances of foreign banks, deposits of government held by banks etc. The size of NNML is not very large in the context of developing countries and same is true for Jordan. Hence, we would like to concentrate more on the role played by active financial assets and factors influencing these assets.

With this brief theoretical frame work we would like to present here the regression analysis of factors influencing monetary base and money supply in the case of Jordan's economy so as to highlight proximate derterminant of liquid financial assets. Prior to this, we would like to reflect on the actual growth rate of liquid finacial assets.

The volume of highly liquid financial assets in Jordan was 129.13 million J.D. in 1970 and it has grown significantly to touch 4266.90 million J.D. in 1992, which is a rise of 3204.34% over the earlier one. This is clearly indicated from table (4-1) which shows the compositon

Table : (4-1)
Composition of Highly Liquid Financial Assets*

(Million J.D)

Year	Currency in Circulation	Demand Deposit **	Quasi Money ** (Savings & Time Deposits)	Other Deposits ***	Total 1+2+3+4
	1	2	3	4	5
1970	82.43	23.03	23.67		129.13
1971	83.01	24.99	27.11		135.11
1972	81.47	33.55	31.45		146.47
1973	97.48	41.77	36.82		176.05
1974	115.45	56.51	47.83	0.78	220.57
1975	138.95	85.65	63.75	1.30	289.65
1976	161.36	115.51	101.44	2.06	380.37
1977	187.99	143.00	136.66	2.61	470.26
1978	219.46	155.91	231.32	6.55	613.24
1979	275.39	197.26	300.45	11.22	784.32
1980	351.63	243.14	390.00	15.65	1000.42
1981	412.31	289.39	478.22	31.21	1212.09
1982	469.98	317.52	615.84	40.47	1443.81
1983	516.05	353.37	745.74	62.43	1677.59
1984	530.52	347.87	879.27	76.42	1834.08
1985	531.79	316.43	1026.62	102.82	1977.66
1986	583.87	313.23	1175.33	108.84	2181.27
1987	655.78	324.02	1392.35	129.69	2501.84
1988	811.16	370.19	1465.36	126.91	2773.62
1989	871.13	455.38	1644.59	124.78	3095.88
1990	1006.16	426.60	1689.87	81.19	3203.82
1991	992.40	608.00	2117.10	92.60	3810.10
1992	1003.90	712.20	2476.90	73.90	4266.90
Growth Rate	12.86	14.31	22.73	8.58	17.08

* Also represent components of Money Supply.

** Present deposits of "private sector resident and municipalities and public entities" with Central Bank of Jordan and licensed banks include Housing Bank Denominated in JDs and foreign currencies.

*** Demand deposits + Savings deposits and Time deposits with (Specialised Credit Institutions, Other Financial Corporations and Postal Savings Funds) - (Cash with Specialised Credit Institutions and Other Financial Corporations).

Sources of data :

(1) "1970-1981"Yearly Statistical Series, Oct., 1989, CBJ.

(2) "1982-1990" Monthly Statistical Bulletin, Dec., 1992, CBJ.

(3) "1991-1992"Yearly Statistical Series, Oct., 1993, CBJ.

of highly liquid financial assets. It indicates that the annual trend of growth rate of highly liquid financial assets during 1970 and 1992 was 17.08 percent per annum. The component of these assets namely currency, demand deposits, savings deposits, time deposits and other deposits have showed a sizeable expansion in their volume. In 1970 currency in circulaton was 82.43 million J.D. which went up to 1003.90 million J.D. in 1992. This showed a rise of 1117.88% over the earlier one. The annual trend growth rate in case of currency during the period was 12.86 percent per annum. Similarly, demand deposits, (saving deposits and time deposits) have shown double digit growth rate. It was 14.31% in case of demand deposits while quazi money grew by 22.73% per annum.

Though most of the highly liquid financial assets have shown a significant growth rates during 1970-1992, there was a remarkable shift in public preference. Currency constituted about 64% of total broad money in 1970. Its relative share since then has stooped to 23.53% in 1992. The relative share of demand deposits has remain stable around 18% throughout, although during 1974 to 1981 it was around 27% of the total liquid financial assets. Over the period of our study, savings deposits and time deposits have shown steady improvement in their relative share in total highly liquid financial assets. The relative share of quazi money has improved from 18.33% in 1970 to 58.05% in 1992. This increase is mainly due to the growth of time* deposit.

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* It is shown in earlier chapter table : (3-4) page 54 that, the relative share of time deposits with licensed banks has grown. Its ratio in total deposits has improved from 36.42% in 1970 to 64.02% in 1992.

A contineous fall in the relative share of currency in the total highly liquid assets, and at the same time an improvement in the relative share of savings and time deposits in the total liquid assets. These two are symptoms of healthy economy. These changes indicate a structural transformation of financial sector which we believe would contribute to high growth rate and effeciency.

Role of Multiplier and Monetary Base in the Growth of Highly Liquid Financial Assets.

As mentioned earliar, the growth of liquid financial assets can be attributed to two components .

1. Change in the volume of liquid financial assets due to a change in the components of money multiplier.

2. Change in the volume of liquid financial assets due to a change in the monetary base.

A) Multiplier and Financial Assets :

Changes in the size of multiplier and menetary base are brought about by various factors. Some of them are policy induced factors and others are exogenous. Many empirical studies conducted in case of Jordan and other countries show that money multiplier "m" can be treated as a behavioural stable parameter*. These

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* *See for example :* Cagan, Philip, "Determinants and Effects of Changes in Stock of Money" 1875-1960. National Bureau of Economic Research, New York, Columbia University Press, (1965). *and see again* Friedman, M. and Schwartz A., "A Monetary History of the United States, 1867-1969" Princeton University Press, (1963). *See also* Haddad, Adeeb, "The Determinents of the Money Supply in Jordan" Central Bank of Jordan, Library, (17 March, 1985).

studies reveal that factors operating on "m" are less significant in the long run and hence, large part of changes in liquid assets are attributed to monetary base.

Behaviour of multiplier in case of Jordan is shown in table (4-2). It reveals that during the period under study, i.e., 1970-1992, the value of "m" increased from 1.328 to 3.190. The variation was much more significant up to 1981 when "m" increased from 1.328 to 2.269. From 1982 onward, it has shown stability around 2.45 except for one year 1987 when it touched figure of 3.190. So we conclude that even though the monetary multiplier has varied during the period of the study, the variation was not that significant specially after 1982. This indicates less greater stability. Large part of the variation in the supply of highly liquid financial assets, we believe are mainly due the monetary base.

B) Monetary Base :

Varations in monetary base or reserve money are mainly caused by the Central Bank of Jordan net credit to the following sectors.

(I) Public sector (PUS),

(II) Financial system (FIS),

(III) Private sector (PVS),

(IV) Foreign sector (FOS),

(V) Others (OTH).

Table : (4-2)

Value of Multiplier

year	m	Money Supply	Reserve Money
1970	1.328	129.13	97.26
1971	1.358	135.11	99.49
1972	1.445	146.47	100.66
1973	1.503	176.05	117.17
1974	1.570	220.57	140.51
1975	1.271	289.65	173.55
1976	1.757	380.37	216.49
1977	1.842	470.26	255.23
1978	2.045	613.24	299.92
1979	2.062	784.32	380.31
1980	2.078	1000.42	481.41
1981	2.269	1212.09	534.11
1982	2.420	1443.81	596.54
1983	2.526	1677.59	664.13
1984	2.709	1834.08	676.99
1985	2.814	1977.66	702.68
1986	2.910	2181.27	749.69
1987	3.190	2501.84	784.25
1988	2.885	2773.62	961.28
1989	2.722	3095.88	1137.15
1990	2.501	3203.82	1281.15
1991	2.288	3810.10	1665.50
1992	2.427	4266.90	1758.10

$$m = \frac{\text{Money Supply}}{\text{Reserve Money}}$$

Sources of Data :

(1) "1970-1983" Yearly Statistical Series, Oct., 1983, CBJ.

(2) "1984-1990" Yearly Statistical Series, Sept., 1991, CBJ.

(3) "1991-1992"Monthly Statistical Bulletin, Dec., 1992,CBJ.

(4) Reserve Money for 1970-1983 taken from International Financial Statistics (I.M.F.), where as rest of it has been taken from various issues of "Monthly Statistical Bulletin", (March 1987), (Dec 1988), (Dec 1991) and (Dec 1992), Central Bank of Jordan.

Our analysis of monetary base shows that credit to the foreign sector and to the government has strongly influenced monetary base. Subsequently the credit granted by the central bank to rest of the sectors has influenced monetary base as shown in table (4-3).

Foreign Sector :

The analysis of supply of reserve is broken down into two different periods owing to the fact that economy of Jordan has shown more fluctuation in some period than others. As table (4-3) clearly shows, till 1981 more than 80% of total variation in the reserve money was due to credit granted by the central bank of Jordan to foreign sector. The share of foreign sector in the reserve money declined slowly after 1982 and it remained as low as 22.2% in 1988, and then lower than 30 percent in 1989 and 1990. This is mainly due to the recession which hit world and Arab economies in early eighties. Consequently the sources of strength of the Jordanian economy were considerably enfeebled. It led to drop in Jordanian remmitances from abroad and decline in Arab aids receipt to Jordan. Again exports reciepts fallen down as a result of recession hit Jordan's traditional markets[2]. Foreign aid has decreased. Unemployment phenomenon has appeared in the market and to compensate the decrease in external revenue, the government resorted to foreign borrowing which in turn led to fall in the Central Bank of Jordan foreign reserves and the exchange rate of the Jordan dinar fall down in 1988. But once again the share of foreign

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(2) Diwiri, Khalil, "Monetary Policy in Jordan Economy" Un-published Post Graduate Diploma **"Arabic Script"** National institute of Planning Cairo, Egypt. (December 1987), Page 17.

Table : (4-3)

***Major Factors Affecting Reserve Money**

Year	Foreign sector	Public sector	Financial sector
1970	0.939	0.130	0.018
1971	0.897	0.190	0.015
1972	0.962	0.095	0.012
1973	0.857	0.196	0.018
1974	0.781	0.196	0.028
1975	0.917	0.082	0.025
1976	0.808	0.148	0.052
1977	0.895	0.117	0.057
1978	0.953	0.064	0.063
1979	0.990	0.051	0.046
1980	0.889	0.157	0.047
1981	0.835	0.172	0.066
1982	0.651	0.254	0.118
1983	0.645	0.215	0.176
1984	0.604	0.200	0.191
1985	0.576	0.200	0.210
1986	0.574	0.208	0.221
1987	0.440	0.370	0.223
1988	0.222	0.627	0.189
1989	0.290	0.538	0.252
1990	0.285	0.497	0.404
1991	0.542	0.239	0.251
1992	0.545	0.270	0.219

*For further details see Appendix - 3.

Source of Data : Author's Calculation from the following sources :

(1) "1970-1983" Yearly Statistical Series, 1964-1989, Central Bank of Jordan

(2) "1984-1986" Monthly Statistical Bulletin, March 1987, Central Bank of Jordan.

(3) "1987-1988" Monthly Statistical Bulletin, December 1988, Central Bank of Jordan.

(4) "1989-1990" Monthly Statistical Bulletin, December 1991, Central Bank of Jordan.

(5) "1991-1992" Monthly Statistical Bulletin, December-1992, Central Bank of Jordan.

sector in reserve money rose more than 50 percent in 1991. This rise was primarily attributed to the flow of savings of Gulf countries returnees, foreign aids and rescheduling of a considerable part of Jordans external debt.[3] This clearly implies that foreign sector played a major role in determining the reserve money and subsequent changes in the volume of highly liquid financial assets were affected.

A model has been set up in which Reserve Money RM is expressed as a function of foreign assets holdings. We have estimated this functional relationship using log function.

The Model is RM = a + b FOS. The estimate of the regression for the period (1970-1981) is presented below

$$\text{Log RM} = 0.173 + \underset{(27.126)}{0.989}\ \text{Log FOS}$$

$$R^2 = 0.987 \qquad \text{D-W} = 1.75$$

The result of the regression reveals that foreign assets have strong and positive influence on the reserve money. Note that the coefficient of independent variable (FOS) is highly significant. Elasticity of RM with respect to FOS is almost unity and it shows equi-proportional change. About 98 percent variation in the dependent variable is due to variable of foreign assets. This estimate significantly supports our contention that monetary base in Jordan has become highly sensitive to foreign assets.

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(3) Twenty Eighth Annual Report, 1991 Central Bank of Jordan P. 2.

The monetary experience of Jordan ecomomy during 1981-1992 shows that the influence of foreign assets on the reserve money has been weakend. The double log outcome for the period 1981-1992 is as under.

$$\text{Log RM} = 3.79 + \underset{(1.870)}{0.494}\ \text{Log FOS}$$

$$R^2 = 0.259 \qquad \text{D-W} = 0.232$$

The estimate of regression reveals that during 1981-1992, responsiveness of RM to FOS was very poor. Regression co-efficient of independent variable is not significant and other test are also very poor so that we regressed in changes RM with change in FOS with a hope of getting better fit. But we find that there is no improvement in the results. We suspect that relative importance of foreign assets have declined considerably during 1981-1992 and a shift in the function has taken place.

The marginal impact of variation in foreign assets was as high as 52% during the period of our study (1970-1992) as shown below.

$$\triangle RM = 53.245 + \underset{(5.147)}{0.519}\ \triangle FOS$$

$$R^2 = 0.56 \qquad \text{D-W} = 0.842$$

For the entire period of 1970-1992, about 56 percent variation in RM is caused by change in FOS. The value of D-W shows the presence of auto-correlation among residuals.

With a view to getting better insight into the behaviour of reserve money and its responsiveness, we carried out regression analysis for the period from 1970-1981 and 1981-1992. The estimate of regression for period 1970-1981 is presented below :

$$\triangle RM = 15.199 + \underset{(3.561)}{0.75} \triangle FOS$$

$$R^2 = 0.559 \qquad D\text{-}W = 1.459$$

Note that about 56 percent variation in the reserve money is due to change in foreign assets holding. The regression co-efficient attached to FOS has come out with the correct and expected sign. The marginal impact of foreign assets on the RM was as high as 75 percent, but the same is not true for the period 1981-1992. The results of regresison for the period 1981-1992 clearly shows that the marginal impact of change in FOS has been substantially reduced to as low as 49 percent as seen from the following estimate.

$$\triangle RM = 84.626 + \underset{(4.293)}{0.496} \triangle FOS$$

$$R^2 = 0.642 \qquad D\text{-}W = 1.024$$

From the results of regression relating to different periods such as entire period 1970-1992, and sub periods 1970-1981 and 1981-1992 it becomes clear that :-

a) Foreign assets has positive influence on the reserve money. This was strong during the period 1970-1992. Its marginal influence has remained 52 percent.

b) During 1970-1981, the RM was significantly and positively influenced by FOS. Its marginal impact on △RM was about 75 percent.

c) During 1981-1992, we observed that the influence of FOS on the RM has been considerably reduced to 49 percent. This clearly indicates some structural shifts in the relative importance of FOS. This is more clear by looking at table (4-3) indicating that after 1981 foreign assets have shown steep decline. It has fallen from 83.5% in 1981 to 22.2% in 1988 and shown an increase to 54.5% in 1992.

Public Sector :

Fiscal operation of the government is another important factor which influences the monetary base in Jordan and hence the supply of highly liquid financial assets. The credit granted by central bank to public sector was less than 20% of the total reserve money in Jordan between 1970 and 1981. In fact in the year 1978 and 1979 it was as low as 6% and 5% respectively of the total reserve money. It was only after 1981, that the relative share of the public sector (Net Claims on Government) in the total reserve money crossed a mark of 20%. Throughout the period of our study (1970-1992) the relative share was more than the 1/5 of the total reserve money, but it fluctuated widely. It was as high as 62.7% in the year 1988 and 53.8 in the year 1989. Since then it has shown a relative decline. Once again it was around 25% in 1991 and also in 1992. The above stated movement in the relative share of the claims of the central bank of Jordan on the government clearly shows

that during the second half of our study i.e., 1981-1992, the influence of the claims became a more important variable influencing the behaviour of the reserve money in Jordan. So that we have estimated the degree of association between RM and credit of the central bank of Jordan to public sector (PUS) using log function.

The regression estimate is presented below for the period (1970-1992)

$$\text{Log RM} = 3.329 + \underset{(11.76)}{0.620}\ \text{Log PUS}$$

$$R^2 = 0.868 \qquad \text{D-W} = 0.835$$

The above regression shows that elasticity of supply of RM is 0.6 with respect to PUS. The regression coefficient is highly significant in terms of test of individual parameter. Though D-W statistics is poor, our estimate is reliable in term of correct sign of regression coefficient and high value of R^2.

While investigating the effectiveness of PUS in bringing relative change in the RM, we find that, as compared to the period of 1970-1981, influence of PUS has gone down during 1981-1992. Regression results confirm our view point. The regression estimate for the period 1970-1981.

$$\text{Log RM} = 3.053 + \underset{(3.648)}{0.703}\ \text{Log PUS}$$

$$R^2 = 0.571 \qquad \text{D-W} = 1.061$$

The same for the period 1981-1992.

$$\text{Log RM} = 4.216 + \underset{(4.772)}{0.465}\ \text{Log PUS}$$

$$R^2 = 0.695 \qquad \text{D-W} = 0.717$$

It is observed that during 1970-1981, the elasticity of RM with respect to PUS has gone up to 70 percent. But it has showen a considerable fall during 1981-1992 . The elasticity has fallen from 70 percent to 46 percent. Again, it indicates that the value of D-W statistics which was 1.061 in the first half has gone down to 0.717 in the second half of the period on study. This shows the presence of auto-correlation among residuals. Thus, it is established that after 1981 the influence of PUS on the RM has relatively declined causing reduction in the growth of highly liquid financial assets.

Financial System :

Assistence to financal system in Jordan by the central bank of Jordan is another important factor which influences the reserve money or the monetary base in Jordan.It was not a significant factor till 1980. Its relative share in the total reserve money has averaged to 2% during 1970-1975 which went up to 5% or less than that during 1975-1981.It is chiefly since 1982 that its relative share in the total reserve money went up from 11% to 40% by the year 1990. Once again the relative share has shown a decline from 40% to almost its half say around 21.9% in the year 1992.

The above relative behaviour shows that the CBJ credit to financial system was very small till 1980, and so it was not considered as one

of the major factors to influence the monetary base. But certainly during 80s, it was recognised as an impontant factor influencing the monetary base and the supply of liquid financial assets more specially during 1981-1987.

The regression estimate for the entire period of our study i.e., 1970-1992, shows that credit to financial system has a positive influence on the dependent variable.

$$\text{Log RM} = 4.421 + \underset{(26.83)}{0.462}\ \text{Log FIS}$$

$$R^2 = 0.972 \qquad \text{D-W} = 0.901$$

The regression co-efficient is significant and shows that elasticity of RM to be 0.46 with respect to FIS.

As stated earliar, the FIS started playing somehow significant role in influencing the RM only after 1975 which continued till 1990. In fact the FIS played very important role in varying the RM between 1981-1987. The following is the regressions relationship between the change in the RM and that in the FIS.

$$\text{The model is } \Omega\text{RM} = f(\Omega\text{FIS})$$

(A) For the period (1976 – 1990)

$$\Omega\text{RM} = 57.938 + \underset{(2.285)}{0.465}\ \Omega\text{FIS}$$

$$R^2 = 0.287 \qquad \text{D-W} = 1.359$$

The regression outcome shows that for the period 1976-1990, the regression co-efficient has correct positive sign which was about 28 percent △RM is explained by △FIS. The test of individual parameter is very poor. But when we run regression for the period of 1981-1990 we find the following out come

(B) For the period (1981-1990)

$$\triangle RM = 56.316 + \underset{(1.821)}{0.478} \triangle FIS$$

$$R^2 = 0.293 \qquad D\text{-}W = 1.369$$

From the above regression for periods 1976-1990 and 1981-1990, we do not notice significant improvement in the explanation ; specially when we regress for 1981-1990. But when we estimated it for the period 1981-1987 we found better explanation of the behaviour of the reserve money.

(C) For the period (1981-1987)

$$\triangle RM = 20.131 + \underset{(2.428)}{1.063} \triangle FIS$$

$$R^2 = 0.541 \qquad D\text{-}W = 1.011$$

The above regression of period (1981-1987) indicate that co-efficient attached to △FIS has expected positive sign and significant at 5 percent level by usual test. Also the value of R^2 has gone up to 0.541 which implies that 54 percent variation in the RM is caused by independent variable. In fact, we get a better result and good fit per period 1981-1987.

From the regression analysis carried out so far, we derive the following conclusion :

(1) The reserve money is significantly and positively related to the credit granted by the central bank to the government except for the sub period 1981-1992 as revealed by the regression estimate showen in page number 88.

(2) The credit of the central bank of Jordan to foreign sector has strongly and positively influenced the behaviour of the reserve money during the period of our study. Both these factors viz. credit to public sector and credit to foreign sector, account for more than 70 percent variations in the reserve money in Jordans economy.

(3) We also find that credit to financial system has positive influence on the reserve money. But its influence was stronger during the period of 1981-1987. Since the RM has responded to sectoral credit it strengtheness our explanation of the growth of liquid financial assets in Jordan.

Supply of Less Liquid Financial Assets

Having examined the factors effecting the supply of highly liquid financial assets, we would like to discuss the growth of less liquid financial assets and the factors responsible for the variation in the quantity of such assets supplied. Like many developing economies, Jordan economy has relied upon the government for resource mobilization so as to promote economic development. In fact the government has come forward to play a significant role in Jordans

economy during last two decades. Less liquid claims are being issued by the government of Jordan such as treasury bills, government bonds and other securities. The need for generating such claims has been mounting in the recent years due to large fiscal deficit which occurs as a result of excessive expenditure over revenue receipts. Expenditure is growing higher due to developmental role of the government . The revenue receipts from all sources (taxes and non-tax sources of revenue) have not kept pace with mountintg expenditure. This results into a continuous growth in deficit.

Unlike Keynesian expenditure variable, we have developed a concept of the government need for internal finance. *In our analysis we emphasize it which we have derived from several factors. Thus "G" stands as government need for internal finance derived out of "Expenditure + Net lending - External Finance - Foreign Aids - Uses of Cash Balances". This equation showing constitution of "G" is given in Table(4-4). This indicates that the need of the government for internal finance was about 40.92 million J.D in 1970 and though declined a bit in following years it has grown again considerably in later years to touch the mark of 1071.40 million J.D in 1992. This is about 2518.18% growth rate over that of 1970. Looking at table 4-5, it becomes clear that deficit is mounting year after year, which in turn has led to increase in the government borrowing and to increase in national internal debt. It is this need which exceeds revenues to constitute true fiscal deficit. The government of Jordan has attempted

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* This concept of "G" Firstly was applied by Pathak, D. S in his published Ph.D. thesis, "Working of Monetary System in India" M. S. University of Baroda Press, (Sadhana Press), Baroda INDIA, 1979.

Table : (4-4)
Constituents of Government Need For Internal Finance

(Million J.D)

Year	Government Expenditure (+)	Net Lending (+)	External Finance (-)	Foreign Aid (-)	Uses of Cash (-)	G 1+2+3+4+5=6
	1	2	3	4	5	6
1970	80.40	0.31	1.45	35.42	9.38	34.46
1971	85.68	0.28	3.58	35.12	-0.58	47.84
1972	66.08	0.05	3.94	45.56	-30.18	46.81
1973	112.65	0.20	8.22	43.57	5.56	55.50
1974	138.23	0.29	9.36	57.65	-2.31	73.82
1975	183.62	10.95	9.25	97.11	-4.17	92.38
1976	243.98	11.26	12.76	66.24	55.76	120.48
1977	307.93	17.60	51.58	122.20	-0.12	151.87
1978	340.10	10.89	82.89	81.70	14.49	171.91
1979	475.37	26.90	29.69	210.30	47.49	214.79
1980	512.54	26.84	54.60	209.30	38.12	237.36
1981	576.17	40.11	54.73	206.31	29.98	325.26
1982	643.65	30.97	55.50	199.58	38.31	381.23
1983	630.04	35.76	60.38	197.01	-0.21	408.62
1984	640.64	22.47	85.38	106.11	42.37	429 25
1985	713.44	26.95	124.97	187.84	-39.12	466.70
1986	770.13	41.10	86.11	143.71	75.92	505.49
1987	825.71	31.57	7.24	127.54	95.84	626.66
1988	910.87	-6.53	-10.91	155.43	100.16	659.66
1989	947.92	16.30	96.01	261.72	18.77	587.72
1990	1001.21	2.47	72.70	162.60	00.00	768.34
1991	1101.43	-35.79	313.70	230.27	-301.67	823.34
1992	1167,20	-13.00	242.90	198.40	-359 50	1071.40

Source of Data :

(1) "1970-1990" International Financial Statistics, Year Book, 1993, IMF.

(2) "1991-1992" International Financial Statistics, Monthly Supplement, September, 1994, IMF.

to bridge this gap by issuing claims on itself. A variety of claims such as bills and various types of bonds has been issued by both public and private sectors. The rate of rise in less liquid claims thus, has been substantial.

Table (4-6) gives the break up of less liquid claims issued by public and private sector agencies. The table clearly indicates that all these claims without any exception have exhibited a continuous upward trend. In all the categories of less liquid claims, treasury bills and government bonds have remained predominent. For instance, in 1970, treasury bills issued were worth 42.80 million J.D. They went up to the value worth 284 million J.D in 1981, which further increased to that of 923 million J.D in 1991, and ultimately reached the value worth 986.00 million J.D. in 1992. This value was about 65.74% of the grand total of the claims issued by public and private sectors and about 69.73% of the claims issued by public sector alone. Thus, in treasury bills phenomenal growth has taken place. The same is true about government bonds. The bonds issued in 1971 were worth 3.00 million J.D which increased to the value of 9.00 million J.D in 1991. This ultimately stood at a very high issue of 396.00 million J.D in 1992 which is about 26.40% of the total less liquid claims issued by public and private sectors and about 28% of the caims issued by public sector alone in the same year. Whereas the public corporation bonds and

Table : (4-5)
Fiscal Policy And The Domestic National Debt

Year	G	Revenue	Revenue–G Deficit Surplus D/S*	Net Claims on Govt.	Change in Net Claim	National Internal Debt.	Change in National Internal Debt.	C.R Change in Revenue
1970	34 46	30.26	-4 20	3 100	13.30	14.30	5 90	-2.46
1971	47.84	35.74	-12.10	20 20	17 20	27.13	12 83	5 48
1972	46.81	42 56	+25 93	19 10	-1 10	35 29	8.16	6 82
1973	55 50	46.18	-9 32	32 90	13 80	49 41	14.12	3.62
1974	72.82	65.74	-8 08	32.80	-0 10	52 98	3.57	19.56
1975	92.38	82 63	-9 75	25 50	-7.80	65 37	12.39	16 89
1976	120 48	107.59	-12.89	41 30	15 80	89 31	23 94	24 96
1977	151.87	142.25	-9.62	46 90	5 60	109 84	20 53	34 66
1978	171 91	158.49	-13.42	69 60	22 70	146 18	36.34	16 24
1979	214 79	187 90	-26 89	56 90	-12.70	150.36	4 18	29 41
1980	237 36	226.15	-11 21	72.00	15.10	197.82	47 46	38 25
1981	325 26	309.04	-16.86	114 80	42.80	231.65	33.83	83 05
1982	381.23	362 04	-19 19	196 30	81.50	276.15	44 50	52.84
1983	408.62	400.58	-8 04	210.10	13.80	314 07	37.92	38 54
1984	429.25	415.01	-14.24	260 20	50.10	342.67	28 60	14.43
1985	466 70	440 81	-25 89	305 00	44.80	370.39	27 72	35 80
1986	505.49	514.39	+8.90	335.00	30 00	414 90	44 51	73.58
1987	626.66	531.53	-95.013	568 50	233.50	624 37	209.47	17.14
1988	659.66	544 34	-115 32	888.00	319 50	921 77	294 40	12.81
1989	587 72	565 40	-22.32	924.70	39.70	994.97	73 02	21 06
1990	768 38	748.08	-22.30	961 70	34.00	1037.62	42 65	182 68
1991	823 34	829 043	+6 09	986.90	-274 80	1061 72	24.10	81.35
1992	1071 40	1100 00	+28 60	949 40	-37 50	1041.49	-20 23	270 57

* D/S = Deficit / Surplus

Source of Data :

(1) Same as Table : 4-4.

(2) "National Internal Debt." Data Quoted from "Yearly Statisticsl Series" Oct. 1994, Central Bank of Jordan.

Table : (4-6)
Composition of Less Liquid Financial Assets

(Million J.D)

Year	Treasury Bills	Government Bonds and Notes	Public Corpora-tion Bonds	Treasury Bonds	Total 1+2+3+4	Shares Issues	Commercial Bonds	Grand Total 5+6+7
	1	2	3	4	5	6	7	8
1970	42.80	0.00	0.00	0.00	42.80	N.A	0.00	42 80
1971	79 50	3.00	0.00	0 00	82 50	N.A	0.00	82.50
1972	81.00	5.00	0.00	0 00	86 00	N.A	0.00	86.00
1973	87.95	4.00	0 00	0 00	91.95	N A	0 00	91.95
1974	104.99	5.00	0.00	0.00	109.00	N A	0 00	109 00
1975	114.00	9.00	0.00	0 00	123 00	N.A	0.00	123.00
1976	134.00	9.00	0.00	0.00	145.00	N A	0.00	145 00
1977	146.00	12 00	0 00	0.00	158.00	N.A	0 00	158 00
1978	186.00	10.00	9 00	0.00	205.00	14 67	0 00	219 67
1979	219.00	11.00	0.00	0.00	230.00	50.60	5.00	285.60
1980	254.00	10.00	9.00	0 00	273.00	79 57	10 00	362.57
1981	284.00	9.00	2.15	0 00	295 15	76.21	15.00	386.36
1982	305.00	12.00	6.00	0 00	323.00	104 60	40.00	467.60
1983	377.00	12.00	2.00	0.00	391.00	63.60	62.00	516.60
1984	401.50	13.00	0.00	0.00	414 50	65.66	81 50	561.66
1985	430.00	20.00	0.00	0 00	450 00	11 75	85 00	546 75
1986	472.00	15.00	3.00	24.00	514 50	10.90	96.30	621.70
1987	729.00	26.00	0 00	40.00	795.00	31 10	83 00	909.10
1988	729.00	17.00	9 00	35 00	790.00	8.50	78 71	877.21
1989	714 00	18.00	4 18	47 00	783.10	21.85	67 46	872.49
1990	882.00	22.00	2.15	48 00	754 15	10.40	60 86	1025.49
1991	923.00	38.00	22.00	0 00	983 00	20 72	44 80	1048 52
1992	986.00	396.00	0 00	32.00	1414 00	53 61	32 30	1499.91

* N.A means that data are not available.

Sources of Data :

(1) Columns 1, 2, 3, 4 taken from Yearly Statistical Series, Oct., 1993, CBJ.

(2) Column 6, Annual Statistics 1988-1993, Amman Financial Market.

(3) Column 7, Up to year 1986 taken from Monthly Statistical Bulletins. March, 1987 whereas rest of the years taken from Dec., 1992 Issue, CBJ.

the treasury bonds which were issued for the first time in 1974 and 1986 respectively remained less significant as compared to treasury bills issued. The table clearly indicates that less liquid claims have increased from a very low value of 42.80 million J.D in 1970 to that of 1499.91 million J.D in 1992. This presents a 35.04 fold increase in a time span of 23 years. One notices a contineus growth in these claims against which credit of banking sector has expanded.

Looking at the revenue pattern, one notices that the total revenue receipt in 1970 was 30.26 million J.D, but it went up to 309.20 million J.D in 1981 and by 1992 the figure rose upto 1100.00 million J.D Despite the growth in revenue from taxation and non-tax sources, the deficit has increased from 4.20 million J.D in 1970 to 115.32 million J.D in 1988. However, it declined to 22.30 million J.D in 1990. This was an exceptional years in which surplus position prevailed. Like many developing economies Jordan has also experienced low growth of capital market. From the information available to us, we can observe that the equity was as low as 14.67 million J.D in 1978 and it fluctuated thereafter but never exhibited a continuous upward trend. Similarly commercial bonds issued also do not form a significant part of the capital market. It has never exceeded 15.5% of the capital market. So, equity and commercial bonds are excluded from the regression analysis as they lake the time series data. Thus, it is evident from table (4-6) that among the less liquid financial assets, claims on the government in the form of treasury bills and bonds have grown much faster. Note that credit of banking sector to the government is the same thing as the government supply of less liquid claims.

We expect a close correspondence between change in net claims on the government and fiscal deficit.

$$\triangle NCG = f(\text{Deficit / Surplus})$$

The regression analysis for the period 1970-1992 is carried out with a hope to get better fit. The result of the same is given below.

$$\triangle NCG = -15.55 + \underset{(6.370)}{2.652}\ D/S^{*}$$

$$R^2 = 0.660 \qquad D\text{-}W = 2.210$$

The regression result reveals that unitary change in deficit / surplus in the budjet of Jordan government results into a change of 2.65 units in the net claims on government by banking system. Note that a change of about 66 percent in net claims on the government is explained by fiscal deficit / surplus. Deficit is positively correlated with change in net claims on the government (△NCG) and the regressicon coefficient is significant. The value of D-W = 2.210 shows the autocorrelation. Since △NCG will increase more than proportionately it is clear that the supply of claims on the government will increase simultaneously.

We have also tried to estimate the functional relationship for the period 1981-1992 . The regression results shown below indicate that strong positive correlation exists between deficit and change in the credit of the central bank to the government.

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* D/S = Deficit / Surplus

$$\triangle NCG = -22.054 + \underset{(4.860)}{2.885} \; D/S$$

$$R^2 = 0.70 \qquad D\text{-}W = 2.347$$

The regression coefficient has come up with expected positive sign and it is very significant. About 70 percent variation in the △NCG is explained by deficit / surplus. Note that after 1981, the monuting deficit has strongly influenced the credit of the central bank to the government. D-W = 2.347 is significantly different from zero and it shows zero auto-correlation among residuals. As stated earlier, expenditure and revenue pattern plays a dominent role in explaining supply conditions of less liquid financial assets. Given the level of expenditure. We expect (RT) to be negatively associated with △NCG.

The following regression estimate confirms our view point.

$$\triangle NCG = 98.424 - \underset{(-1.306)}{0.691} \; \triangle RT^*$$

$$R^2 = 0.146 \qquad D\text{-}W = 2.137$$

Note that the regression coefficient of "RT" comes up with expected negative sign. With the increase in revenue, deficit is expected to fall and hence, further decline in NCG is caused.

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* RT means that Revenue as depicted in table (4-5)

Despite poor t-value and R^2 the above estimate confirms negative association. We suspect small number of observation for having poor results.

From the above analysis, we come to the conclusion that supply of less liquid financial assets has been increasing at a faster pace in Jordan which is mainly due to budgetary deficit or fiscal operations.