MONEY DEMAND AND SUPPLY IN SAUDI ARABIA:

AN EMPIRICAL ANALYSIS

Thesis Submitted for the Degree of

Doctor of Philosophy

at the University of Leicester

by

K. A. AL-BASSAM

Department of Economics

University of Leicester

February 1990

MONEY DEMAND AND SUPPLY IN SAUDI ARABIA: AN EMPIRICAL ANALYSIS

by

K. A. Al-BASSAM

Department of Economics
University of Leicester

ABSTRACT

The main objectives of this study are:

Firstly, to provide a clear picture of the Saudi money market in terms of its main characteristics, its financial institutions and the obstacles facing the market and its financial institutions.

Secondly, to determine appropriate money demand functions for different money definitions in Saudi Arabia, using quarterly data which run from 1976:1 to 1986:4, and to test the stability and forcasting power of these functions.

Thirdly, to determine theoretically and empirically the factors affecting the money supply in Saudi Arabia using annual data which run from 1967 to 1987.

Finally, to determine empirically the factors affecting the Riyal market interest rate (domestic interest rate), using quarterly data which run from 1979:1 to 1988:2.

Several empirical findings of this study deserve to be mentioned here:

(1)   The coefficients of the lagged dependent variables (the adjustment coefficients) of the estimated demand equations for real M_0, M_1. M_2 and $M_2{}^a$ are statistically highly significant. This indicates that the adjustment of the actual demand for real M_0, M_1, M_2 and $M_2{}^a$ to the desired level (equilibrium level) is not instantaneous in Saudi Arabia.

(2)   The real current income (real non-oil GDP) is found to be superior to the expected income (permanent income) in explaining the variations of the demand for real M_0, $M_{.1}$, $M_{.2}$ and $M_2{}^a$ in Saudi Arabia.

(3)   In all the estimated demand equations for real M_0, M_1. M_2 and $M_2{}^a$ the real current income is found to be statistically significant with long-run elasticities around 0.79, 0.70, 1.05 and 1.13 respectively. This indicates that the transaction motive of holding money plays an important role in determining the demand for money in Saudi Arabia.

(4)   The expected exchange rate of the Saudi Riyal against the U.S. Dollar is found to be statistically insignificant in almost all the estimated demand equations for real M_0, M_1, M_2 and $M_2{}^a$. This may be due to the multicollinearity which may exist between this variable and other explanatory

variables of our proposed money function and may also be due to the fact that the exchange rate of the Riyal against the U.S. Dollar has experienced few changes during the period of this study. This implies that the data of the Riyal exchange rate variable does not exhibit sufficient variations over time to detect empirically a systematic relationship between the demand for money and the Riyal exchange rate variable.

(5) In all the estimated equations for real M_0, M_1, M_2 and M_2^a, the expected inflation is found to be statistically significant with high long-run elasticities. This finding indicates that the Saudis are very sensitive to inflation and, consequently, they view real physical assets as an attractive alternative to monetary assets.

(6) The U.S. Dollar short-term market interest rate is found to be statistically significant in all the estimated demand equations for real M_2 and M_2^a. However, it has a negligible short- and long-run impact on the demand for real M_2 and M_2^a.

(7) The Riyal short-term market interest (domestic interest rate) is found to be statistically significant in all the estimated demand equations for real M_1, M_2 and M_2^a. This finding reflects the change in the Saudis' attitude towards acceptance of interest payment and confirms our hypothesis that the Riyal interest rate has a significant and negative influence on the demand for money in Saudi Arabia.

(8)   The U.S. Dollar short-term market interest rate, expected
      exchange rate of Riyal against the U.S. Dollar, and the
      commercial banks' excess liquidity are found to be
      statistically significant with right sign in explaining the
      variations of the Riyal market interest rate (domestic
      interest rate). Moreover, the U.S. Dollar market interest
      rate is found to be statistically highly significant with
      elasticity around unity. This explanatory variable itself
      explains around 77% of the variations in the Riyal market
      interest rate. This finding indicates that the external
      factors (U.S. Dollar market interest rate and the expected
      exchange rate of Riyal against the U.S. Dollar) play
      important roles in determining the Riyal market interest
      rate.

(9)   In this study, the hypothesis that the domestic government
      expenditure, commercial banks' claims on the private sector
      and net private sector balance of payments deficit have a
      significant influence on the growth of the Saudi money
      supply, is tested. The empirical results reveal that the
      commercial banks' claims on the private sector has an
      insignificant effect on the money supply, and that the
      coefficients of the domestic government expenditure and the
      private sector balance of payments deficit are found to be
      statistically significant with high long-term elasticities.
      This implies that the domestic government expenditure and
      net private sector balance of payments deficit are the main
      factors affecting the Saudi money supply in the long-run.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

(iv)

LIST OF TABLES

(viii)

LIST OF FIGURES

page

CHAPTER I

INTRODUCTION

1.1 THE OBJECTIVES OF THE STUDY

Saudi Arabia has an open economy with complete capital mobility. Its people enjoy a high standard of living. However, the Saudi economy exhibits several features of underdevelopment, such as limited absorbative capacity, the existence of unorganised money and capital markets, and the dependence on the export of one primary commodity, viz., oil. Moreover, Saudi Arabia is an Islamic country where interest on any type of loan or deposit is prohibited according to Islamic teaching. During the 1970s and early 1980s, Saudi Arabia experienced drastic increases in oil revenues which led to substantial increases in government expenditure. Consequently, this provided the Saudi monetary and banking system with a unique opportunity to expand and develop within a very short period. The Saudi money market therefore offers a unique case for study.

The major objectives of this study can be summarized as follows:

The first objective is to provide a clear picture of the Saudi money market in terms of its main characteristics, its financial institutions and the main obstacles facing that market and those financial institutions.

The second objective is to determine an appropriate money demand function for different money definitions in the Saudi economy and to test the stability and forecasting power of these functions. This includes a careful search for the appropriate specification of the explanatory variables of these functions which involves testing empirically several important hypotheses, related to the specification of these functions. These hypotheses are:

(1)   Should the real current income be regarded as a proxy for the volume of transactions in the economy, or should the expected real income (permanent income) taken as a proxy for the wealth variable, be used in a money demand function for the Saudi economy?

(2)   Does the openness of the Saudi economy influence the demand for money? That is, do the external factors such as foreign interest rates (particularly the U.S. market interest rate) and the Riyal exchange rates (especially against the U.S. Dollar), affect the demand for money in Saudi Arabia?

(3)   Do the domestic opportunity costs variables, the inflation, and the Saudi Riyal market interest rate, exert a significant effect on the demand for money in Saudi Arabia?

The third objective is to determine theoretically and empirically the factors affecting the money supply in Saudi Arabia. In this study an attempt will be made to test empirically the hypothesis that, in a small developing and open economy like Saudi Arabia, the major factors influencing the growth of the money supply are: the level of domestic government expenditure, the commercial banks' claims on the private sector, and the net private sector balance of payments deficit.

The fourth objective is to determine empirically the factors influencing the Riyal market interest rate in Saudi Arabia (domestic market interest rate) and then to test the hypothesis that, given the openness of the Saudi economy, one would expect that external factors such as foreign interest rates (particularly the U.S. market interest rate) and the Riyal exchange rates (especially against the U.S. Dollar) may have a significant and direct impact on the Riyal interest rate.

Before concluding this section, I should like to point out that, to the best of my knowledge, there has never been a study previous to this one which examines empirically the following:

(1) The impact of the Saudi Riyal market interest rate (domestic interest rate) and the expected Riyal exchange rate against the U.S. Dollar on the demand for money in Saudi Arabia.

(2) The effect of the expected income (permanent income) as a proxy for the wealth variable on the demand for money in Saudi Arabia.

(3) Determining empirically the factors affecting the Saudi Riyal market interest rate.

(4) The impact of the combination of domestic government, the commercial banks' claims on the private sector, and the net private sector balance of payments deficit on the money supply in Saudi Arabia.

1.2 THE ORGANISATION OF THE STUDY

This study consists of seven chapters:

Chapter I, the Introduction, explains the objectives of the study, the methodology employed and the data sources.

Chapter II focuses on some features of the Saudi economy, especially those related to the Saudi monetary and banking system, and on the performance of the economy during the period 1970 to 1986. The major monetary and fiscal objectives of the first three Saudi development plans (1970-1986) and the monetary and fiscal achievements during the same period are also highlighted.

Chapter III provides a brief evaluation of the Saudi monetary and banking system and a clear picture of the Saudi money market in terms of its main characteristics, its financial institutions and the main obstacles facing this market and these financial institutions. Finally, the Riyal off-shore market in Bahrain and its effect on domestic liquidity in Saudi Arabia is discussed.

In Chapter IV, several selective empirical studies which explain theoretically and empirically the behaviour of the demand for money in several countries with diverse economic characteristics (developed and less-developed countries and Saudi Arabia) are reviewed. Some hypotheses tested in these studies were helpful in constructing our empirical model of the money demand for the Saudi economy.

Chapter V is devoted to the specification and estimation of the Saudi money demand functions of different definitions of money. This chapter also includes testing the stability and forecasting power of these functions.

In Chapter VI, the Saudi monetary aggregates are discussed. The relationship between domestic government expenditure, the commercial banks' claims on the private sector, and the net private sector balance of payments deficit is analyzed theoretically and empirically. In this

chapter, the components, sources and controllability of the Saudi monetary base are discussed. Finally, the Saudi money multipliers of different money definitions are derived. The effects of the non-bank public, the commercial banks, and SAMA's behaviour, on the Saudi money multipliers is discussed.

Finally, Chapter VII presents a summary of the work and its conclusions and provides some recommendations based on the empirical findings of the study.

1.3 METHODOLOGY AND SOURCES OF DATA

This study is based on a theoretical and quantitative analysis. Time-series data, different models (static and dynamic) and more than one estimation method are used in our empirical work.

Quarterly data from 1976:1 to 1986:4 is used for estimating the demand for money in Saudi Arabia. This period is selected to capture the effects of the following factors on the Saudi money demand relationship and its stability:

(1) During the period of this study the Saudi economy experienced two very different stages of economic growth. The first stage (1973-1983) represents the oil-boom years. All the major economic and monetary indicators, such as non-oil GDP, aggregate demand, gross capital formation, monetary aggregates, etc. experienced remarkable growth. However, in the second stage, from 1982 to the present, these indicators registered low growth rates.

(2) Very high rates of inflation were recorded between 1973 and 1980. However, since 1981, inflation has fallen rapidly, and in some cases has become negative.

(3) Between 1979 and 1982 the Riyal and U.S. Dollar market interest rates remained high. However, since 1983, they have fallen rapidly.

The quarterly data used to estimate the demand for money in Saudi Arabia is obtained from the monthly publication of the International Monetary Fund, International Financial Statistics (IFS), except for non-oil GDP, U.S. and Riyal market interest rates, which are obtained from SAMA Annual Report, CSO (Central Statistical Office, U.K.) and SAMA respectively. An important point to mention here is that, apart from non-oil GDP which is only available annually, all the data for estimating the demand for money in Saudi Arabia are available on a quarterly basis. Hence, by interpolation I have generated the non-oil GDP data from the corresponding annual data. This technique, which has been used successfully by many researchers such as Diz (1971), Darrat (1981) and El-Masri (1982), will be discussed in detail in Chapter 7.

The quarterly data (1971:1-1988:2) used in estimating the Saudi Riyal market interest rate's relationship with other factors is obtained from SAMA (The Saudi Monetary Agency), CSO (Central Statistical Office, U.K.) and SAMA Annual Report and International Financial Statistics (IFS).

The data on the major factors affecting the money supply in Saudi Arabia, such as domestic government expenditure, the commercial banks' claims on the private sector, and net private sector balance of payments

deficit, are available only on an annual basis. Accordingly, annual data running from 1967 to 1987 obtained from SAMA Annual Report is used for estimating the money supply's relationship. The reasons for selecting this period are:

(1)   In this period the Saudi economy went through two important stages. The first stage was before the sharp increases in oil revenue (before 1973), when the Saudi economy was moving on a steady growth path. The second stage (from 1973 onwards) represents the oil-boom years when all the major economic and monetary indicators, such as non-oil GDP, aggregate demand, gross capital formation, and monetary aggregate, experienced remarkable growth.

(2)   During this period, all the major factors affecting the money supply, such as domestic government expenditure, the commercial banks' claims on the private sector and net private sector balance payments deficit, experienced substantial increases as well as noticeable fluctuations. Consequently, this period (1967-1987) is appropriate for testing empirically the impact of the drastic changes in these factors on the money supply in Saudi Arabia.

CHAPTER II

A REVIEW OF THE SAUDI ARABIAN ECONOMY

INTRODUCTION

As a consequence of the huge oil revenues which accrued to Saudi Arabia as a result of drastic increases in oil prices during the seventies, the Saudi Arabian government launched ambitious spending programmes aiming to build the infrastructure of the economy and create structural changes in the economy. Consequently, during the seventies and early eighties the components of non-oil GDP and total gross domestic expenditure of the Saudi economy experienced high growth

This chapter deals in some detail with the main aspects of the Saudi economy. In section one, the main features of the economy are highlighted. In section two the performance of the economy during the period 1970 to 1986 is analysed. Section three deals with the composition of GDP; manufacturing and agriculture are also discussed in some detail. Section four gives information about the foreign sector which plays a very significant role in the development process of Saudi Arabia and in the international economy. Section five briefly discusses the monetary and fiscal authority's objectives in the first three five-year development plans (1970-1985), and highlights the major monetary and fiscal achievements from 1970 to 1985.

2.1 THE MAIN FEATURES OF THE SAUDI ARABIAN ECONOMY

Before discussing in detail the Saudi economy, it is appropriate to introduce the reader to the main features of the economy.

2.1.1. THE FIRST FEATURE:

The Saudi economy, like most oil-producing developing economies, is largely dominated by the oil sector which has set the pace of overall economic activity. Since the commercial exportation of oil began in the mid-1950s, oil revenues have had an important rippling effect, touching almost all sectors of the economy. As a consequence of its huge oil revenues, the Saudi government launched ambitious programmes aimed at improving the well-being of its citizens and tipping the economic balance in favour of the non-oil sectors. Escalating domestic government spending, particularly in the post-1970 period, resulted in a significant transformation of the financial stucture of the economy, a rapid increase in almost all components of aggregate demand, an increase in the contribution of the non-oil sectors to gross domestic product, and a substantial rise in the rate of domestic inflation.

As shown in Table 2.1, although the non-oil sectors have made a significant contribution to the total GDP over the past fifteen years, the oil sector is still the main contributor. In 1980, the oil sector's contribution to the total GDP was 69.9 per cent at current prices. Since 1982, however, there has been a notable decline in the oil sector's share of the total GDP. This can be attributed to reduced oil

prices on the international market. In short, it appears that the oil sector will continue for a considerable time to be the dominant sector in the economy and the main contributor of foreign exchange to the national income.

The drastic increase in oil revenue during the 1970s, provided the Saudi financial system with a unique opportunity to expand and develop in a very short period. During the 1970s and early 1980s the major financial and monetary indicators experienced rapid increases. For example, the total assets of the Saudi financial system, the total foreign assets of the commercial banks and SAMA (Saudi Arabian Monetary Agency), the capital and reserves of the commercial banks and the specialized credit institutions, the money supply M3, the total deposits in the commercial banks, and the commercial banks' claims on the private sector increased from SR 209.9, SR 141.8, SR 16.4, SR 19.4, SR 24.5 and SR 9.9 in 1976 to SR 702.9, SR 504.7, SR 156.9, SR 134.4, SR 98.5 and SR 56.2 billion respectively in 1983 (see SAMA Annual Reports 1976 and 1985).

2.1.2.THE SECOND FEATURE:

Almost all the Saudi government's revenue is derived from oil exports. There is very little taxation, and no government debt. Government expenditure is therefore financed almost entirely by the oil revenues. Other sources of revenue are at present extremely small, though they have the potential for future growth. These fall into the following four categories: corporate and business taxes; custom duties; charges for government services; and miscellaneous revenues.

As Table 2.2 shows, the contribution of these sources to

government revenue did not surpass 13 per cent during the period from 1974-1981. Since 1981, their contribution has increased noticeably, mainly because of the decline in oil revenues due to the drastic decline in oil prices.

Two issues emerge from this overwhelming dependence on oil. Firstly, forecasting revenues is difficult for any government but it is even more difficult for the Saudi government, where so much of its revenue derives from a single source. Because production and the price of oil are subjected to dramatic fluctations, the budgeted revenue and expenditure are often significantly different from the actual value. Table 2.3 shows that budgeted revenues were smaller than actual revenues for some years during the period 1970 to 1985. This reflects the drastic increases in oil revenues resulting from sharp rises in oil prices and also may reflect the authorities' preference for a budget surplus. The three years (1983-1985) were exceptional. Failure to forecast the degree of downturn in the oil market led to a significant discrepancy between budgeted and actual revenues in 1983. The following two years, 1984 and 1985 (see Table 2.3), also witnessed actual revenues less than the budgeted revenues, though the discrepancy in each of these years was considerably less than in 1983. Secondly, the low share of other sources of government revenue, in addition to low taxation and no government debt, significantly reduced the effectiveness of the fiscal policy in Saudi Arabia. At present, government expenditure is the only fiscal policy instrument available to the Saudi government.

Because the monetary authority in Saudi Arabia has a very limited control over the monetary aggregates, it seems that the behaviour of these aggregates have been determined largely by fiscal operations (i.e.

increasing or decreasing government expenditure), factors which are out of the monetary authority's control. Saudi Arabia, therefore, can be seen as a good example of complete coordination between fiscal and monetary policies.

2.1.3 THE THIRD FEATURE:

Government expenditure has been a major force in the development process of Saudi Arabia. Moreover, it has had a significant influence on the economic activities of the private sector. The infrastructure projects and large-scale investment projects have been mostly financed by government expenditure. Table 2.4 shows how the government fixed capital formation contribution to the total gross fixed capital formation increased substantially during the period 1972 to 1982, indicating the significant role of the government fixed capital formation in the development process.

There are a number of ways in which the government can signficantly intervene in the private sector's economic activities. The most direct way is government expenditure for investment, consumption goods and services. Another is zero rate investment loans available to the private sector by various government lending agencies. The government can also influence economic activities by providing direct subsidies in some areas, especially to the agricultural sector, and some tariff protection to local industries.

Several empirical studies confirmed the significant and positive relationship between the money supply and government expenditure. For example, Suraisry (1979) empirically examined this relationship using annual data that run from 1964-1977. His regression result is:

$$M_3 = \begin{array}{c} -165.75 \\ (2.86) \end{array} + \begin{array}{c} 0.82 \ GEX \\ (36.3) \end{array} \qquad \begin{array}{c} R^2 = 0.99 \\ DW = 1.73 \end{array}$$

where: M_3 = Money supply

GEX = Actual government expenditure

This result indicates that there is a very significant relationship between the money supply and the government expenditure. Al-Bashir (1977) provides econometric evidence on the positive relationship between money supply and changes in government expenditure. In Al-Bashir's model, the money supply defined in the narrow and broad senses (M_1 and M_2) were used as dependent variables. As explanatory variables, GNP was used as a proxy for the level of economic activity and the monetary base (B) was used as a proxy variable for the effect of the government expenditure on the money supply. (The monetary base in Saudi Arabia is significantly affected by the change in government expenditure, therefore it can be considered a very good proxy for the government expenditure). Al-Bashir found that the monetary base and GNP have a significant effect on the money supply. Table 2.5 provides a clear picture of the positive relationship between the Saudi government expenditure, the monetary base and the money supply. This table indicates that the increases in the government expenditure during the 1970s and early 1980s led to noticeable increases in the monetary base and the money supply.

2.1.4 THE FOURTH FEATURE:

The Saudi economy is a very open economy, with negligible restrictions on the movement of commodities and funds. Therefore the effects of external monetary and financial factors, such as foreign interest rates, exchange rates, world inflation, and balance of

payments, have to be taken into account in formulating appropriate financial and monetary policies.

There is increasing evidence that foreign interest rates, particularly U.S. interest rates and the movement of the Riyal exchange rate, especially against the dollar, have significantly affected the demand for money in the Saudi money market which in turn has affected the Riyal interest rate. The net private sector balance of payments deficit is another external factor which has had a significant impact on gross domestic private sector liquidity (see SAMA, Annual Report, 1986, p.18).

2.2   THE PERFORMANCE OF THE SAUDI ARABIAN ECONOMY, 1970-1986

The performance of the Saudi Arabian economy can also be examined by analyzing the changes of non-oil GDP and total domestic expenditures' components

There are several reasons for taking the period between 1970 and 1986 as the basis for our analysis. Firstly, this period witnessed a great increase in oil revenues, which gave Saudi Arabia a unique opportunity to finance its economic development programmes without depending on domestic financial sources such as taxes and government debt and/or international sources such as international aid and loans. Secondly, the economic planning era began in 1970, since when four five-year plans have been launched. Thirdly, the Saudi economy has experienced significant structural changes and the non-oil GDP and the total gross expenditure's components have achieved remarkable increases during this period (see Tables 2.6, 2.7 and 2.8).

Table 2.1   OIL AND NON-OIL SECTORS' PERCENTAGE SHARES OF GDP AT CURRENT AND CONSTANT PRICES

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
At current prices														
1 - Oil sector	82	80	71	67	60	57	66	69.6	64.7	50.1	42.1	39.2	37.6	37.8
2 - Non-oil GDP	18	20	29	33	40	43	34	30.4	35.3	49.9	57.1	60.8	63.48	67.3
a) private	12	13	17	20	23	27	19	17.1	19.7	28.5	34.3	36.8	37.9	36.9
b) government	6	7	12	15	17	16	15	13.3	15.6	21.4	22.4	24	30.10	27.6
At constant prices of 1978														
1 - Oil sector	63.4	59.6	55.5	54.5	51.2	49.1	48.4	46.5	41.5	29.8	27.2	24.2	24.9	25.4
2 - Non-oil sector	35.3	39.8	43.9	44.6	48.2	50.2	51.0	53.5	58.5	70.2	72.8	75.8	75.1	74.6
a) private	24.7	26.6	28.8	29.8	32.3	33.4	34.2	35.4	39.3	48.9	52.1	53.2	54.1	53.1
b) government	16.1	13.2	15.1	14.8	15.9	16.8	16.8	18.1	19.2	21.3	20.7	22.6	21.1	21.5

Sources: 1.   SAMA, Annual Report, different issues, 1976-85

2.   Saudi Arabia, Ministry of Planning, Achievements of the Development Plan   1970-1984:
Facts and Figures, p. 157.

Table 2.2 TOTAL ACTUAL GOVERNMENT REVENUE, ITS COMPONENTS AND THEIR SHARE ON THE TOTAL ACTUAL GOVERNMENT REVENUE
(In SR million)

	Actual Total Government Revenue	Oil Revenue	Percent- age Share	Other Sources of Revenue	Percent- age Share
1971	8000	7073	88	927	12
1972	11100	10173	92	927	8
1973	15400	14298	92	1102	8
1974	41700	39950	96	1750	6
1975	100103	94190	94 ·	5913	6
1976	103384	93481	90	9903	10
1977	135957	121191	89	14766	11
1978	130654	114042	87	16617	13
1979	131505	115078	88	16427	12
1980	211196	189295	90	21901	10
1981	348100	319305	92	28795	8
1982	368006	328595	89	39412	11
1983	246256	186572	76	59684	24
1984	190753	128109	67	62644	33
1985	171510	11900	70	52150	30
1986	133565	88425	66	45140	34

Source:

1. SAMA, Annual Report, different issues, 1974-1985.

2. Saudi Arabia Ministry of Planning, Achievements of the Development Plan 1970-1984: Facts and Figures, p. 152

Table 2.3   BUDGETED AND ACTUAL REVENUE AND EXPENDITURE
                              (In SR billion)

	Budgeted value			Actual value		
	Revenue	Expenditure	Surplus	Revenue	Expenditure	Surplus
1970	6.0	6.0	0.0	5.7	6.1	-0.4
1971	6.4	6.4	0.0	8.0	6.3	1.7
1972	10.9	10.8	6.6	11.1	8.1	3.0
1973	13.2	13.2	6.0	15.4	10.2	5.2
1974	22.8	22.9	0.0	41.7	18.6	23.1
1975	98.2	45.7	52.5	100.1	35.0	65.1
1976	110.9	110.9	0.0	103.4	81.8	21.6
1977	95.8	110.9	-15.1	136.0	128.3	7.7
1978	146.5	11.04	36.1	130.7	138.1	-7.9
1979	130.	148.7	-18.7	131.5	148.0	-16.5
1980	160.0	160.	0.0	211.2	188.4	22.8
1981	261.5	240	17.0	248.1	236.6	111.5
1982	340.0	298.0	42.0	368.0	284.7	83.3
1983	313.4	313.4	0.0	246.3	243.8	2.5
1984	225.0	260.0	-35.0	187.3	222.3	-35.0
1985	214.1	260.0	-45.9	166.9	212.9	-46.0
1986	200.0	200.0	-	131.5	181.6	50.1

Sources:

1.   SAMA, Annual Report, different issues, 1974-1985.

2.   Saudi Arabia Ministry of Planning, Achievements of the
     Development Plan 1970-1984: Facts and Figures, p.152.

Table 2.4   GROSS FIXED INVESTMENT OF SECTORS AT THE CURRENT PRICE AND
THEIR PERCENTAGE SHARE OF TOTAL FIXED INVESTMENT

	Oil Sector's Fixed Investment	Oil Sector's % Share	Government Fixed Investment	Government % Share	Private Sector's Fixed Investment	Private Sector's % Share	Total Gross Fixed Investment
1970	327	12.6	1214	46.7	1056	40.7	2597
1971	577	19.7	1204	40.1	1151	39.2	2932
1972	671	19.7	1442	42.4	1290	37.9	3403
1973	2040	35.8	1985	34.9	1669	29.3	5694
1974	2633	31.3	3416	40.7	2351	28.0	8400
1975	3659	20.5	7370	41.3	6812	38.2	17841
1976	5422	16.1	17440	51.9	10792	32.0	33704
1977	7316	14.2	27352	53.2	16740	32.6	51408
1978	8053	12.0	40484	60.3	18599	27.7	67136
1979	8222	10.7	44031	64.0	19401	25.3	76654
1980	12264	12.6	61598	63.5	23207	23.9	97069
1981	10811	10.1	66874	62.9	28691	27.0	106376
1982	12604	10.7	73881	60.	35830	29.3	122315
1983	14881	12.9	66411	57.5	34162	29.6	115454
1984	15663	14.3	53325	48.4	41107	37.3	110095
1985	14213	14.7	44699	46.3	37734	39.0	96646
1986	8879	11.8	33114	44.2	32934	44.0	74927

Source:

1.   SAMA, Annual Report, different issues, 1979-1986.

2.   Saudi Arabia Ministry of Planning, Achievements of the Development Plan
1970-1984: Facts and Figures.

Table 2.5   GOVERNMENT EXPENDITURE, CURRENCY IN CIRCULATION, RESERVE, MONETARY BASE AND MONEY SUPPLY
(In SR billion)

	Government Expenditure	Currency in Circulation	Reserve	Monetary Base	Monetary Multiplier	Money Supply /M_3
	(1)	(2)	(3)	(4) $2 + 3$	(5)	(6)
1973	10.2	2.5	1.1	3.6	2.4	8.7
1974	18.6	3.4	1.6	5.0	2.8	14.1
1975	35.0	5.1	4.2	9.3	2.6	24.5
1976	81.8	8.6	6.3	14.9	2.5	37.3
1977	128.3	13.6	14.1	27.7	1.9	53.6
1978	138.1	18.0	17.7	53.7	1.2	61.4
1979	148.0	21.0	12.8	33.8	2.2	74.8
1980	188.4	25.2	8.9	34.1	2.8	94.4
1981	236.6	26.1	7.7	33.8	3.5	119.4
1982	284.7	30.4	10.1	40.5	3.3	134.4
1983	243.8	35.3	7.7	43.0	3.3	144.0
1984	222.3	34.7	9.0	43.7	3.4	148.9
1985	212.9	34.7	9.7	44.4	3.4	150.2
1986	181.5	36.9	10.6	47.5	3.2	149.5

Source: This table is compiled from several issues of International Financial Statistics.

Note: M3 =   Currency in hands of non-bank public + demand deposit + time and saving deposits + other quasi-monetary deposits

Monetary Multiplier   = $\dfrac{M_3}{Monetary\ Base}$

Table 2.6   GROSS DOMESTIC PRODUCT OF OIL AND NON-OIL SECTORS, AND KIND OF ECONOMIC ACTIVITY IN PRODUCERS' VALUES

(At Constant Prices of 1970 - in SR millions)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1) Non-Oil GDP	7587	8040	8607	9720	11183	12636	15138	17692	20252	22522	25184	28318	31503	33721	34962	34035	31762
Agriculture, Foresty and Fishing	984	1018	1050	1089	1130	1174	1221	1282	1483	1550	1640	1735	1839	2023	2286	2583	2919
Mining and Quarrying[1]	47	49	55	77	97	82	112	134	146	125	128	153	211	191	186	182	180
Manufacturing[2]	431	484	543	600	665	721	828	955	1104	1276	1477	1711	1982	2299	2599	2570	2319
Electricity, Gas and Water	273	298	329	381	417	322	345	414	546	725	868	1109	1396	1686	1977	2274	2534
Construction[3]	715	692	770	917	1245	2197	3066	3895	4310	4501	4660	5233	6837	5837	5329	4545	3634
Transport, Storage and Communication	1243	1468	1544	1849	2224	1289	1580	1929	2367	2729	3118	3383	3659	3985	4426	4387	3868
Other Services	3894	4031	4316	4807	5401	6851	7986	9083	10296	11616	13293	14994	15579	17700	18159	17494	16308
2) Oil GDP	9566	11542	14014	17413	20063	18903	19112	21626	21513	21999	23869	24653	22383	14309	13033	10883	11062
Mining of Crude Oil and Natural Gas	8106	9922	12427	15556	18158	17339	17510	19852	19650	20112	21652	22487	20233	12038	10464	8298	7953
Petroleum Refining	1241	1355	1304	1378	1417	1300	1359	1523	1591	1688	1749	1745	1716	1749	1979	2027	2366
Construction Associated therewith	219	265	283	479	488	264	243	251	272	199	468	421	434	522	590	558	744
3) Total GDP	17153	19582	22621	27133	31246	31539	34250	39318	41765	44521	49053	52971	53887	48030	47995	44918	42824

Notes: 1) Excluding mining of oil and natural gas.   2) Excluding petroleum refining.
.3) Excluding construction associated with the oil sector.

Sources: 1.   Saudi Arabia, Ministry of Planning, Achievement of the Development Plans 1970-1986: Facts and Figures.
2.   SAMA, Annual Report, 1986.

Table 2.7   PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC PRODUCTION BY KIND OF ECONOMIC ACTIVITY WITHIN SECTORS

(At Constant Prices of 1970)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1) Non-Oil GDP.	43.6	40.4	37.5	35.4	35.3	39.8	43.9	44.6	48.2	50.2	51.0	53.5	58.5	70.2	72.8	75.8	77.4
Agriculture, Forestry and Fishing.	5.7	5.1	4.6	4.0	3.6	3.7	3.5	3.2	3.5	3.5	3.3	3.3	3.4	4.2	4.7	5.7	7.1
Mining and Quarrying1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Manufacturing2	2.4	2.4	2.4	2.2	2.1	2.3	2.4	2.4	2.6	2.8	3.0	3.2	3.7	4.8	5.4	5.8	5.6
Electricity, Gas and Water.	1.6	1.5	1.4	1.4	1.3	1.0	1.0	1.0	1.3	1.6	1.8	2.1	2.6	3.5	4.1	5.0	6.1
Construction3	4.1	3.5	3.3	3.3	3.9	6.9	8.9	9.8	10.3	10.0	9.4	9.8	11.5	12.2	11.0	10.1	8.8
Transport, Storage, and Communication.	7.1	7.4	6.7	6.7	7.0	4.0	4.6	4.9	5.6	6.1	6.3	6.3	6.8	8.2	9.2	9.7	9.4
Other Services.	22.4	20.2	18.8	17.5	17.1	21.6	23.2	23.0	24.6	25.9	26.9	28.5	30.1	36.9	38.0	39.1	40.0
2) Oil GDP.	55.4	58.0	61.0	63.3	63.4	59.6	55.5	54.5	51.2	49.1	48.4	46.5	41.5	29.8	27.2	24.2	22.6
Mining of Crude Oil and Natural Gas	46.6	49.9	54.1	56.6	57.4	54.8	50.8	50.0	46.8	44.9	43.9	42.2	37.4	24.9	21.7	18.4	16.3
Petroleum Refining	7.1	6.8	5.7	5.0	4.5	4.1	4.0	3.8	3.8	3.8	3.5	3.3	3.2	3.6	4.1	4.5	5.0
Construction Associated Therewith	1.3	1.3	1.2	1.7	1.5	0.7	0.7	0.7	0.6	0.4	1.0	0.8	0.9	1.3	1.4	1.3	1.3
3) Total GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTES: 1) Excluding Mining of Oil and Natural Gas.   2) Excluding Petroleum Refining.
3) Excluding Construction Associated with the Oil Sector.

Sources: 1. Saudi Arabia, Ministry of Planning, Achievements of the Development Plans 1970-1986: Facts and Figures.
2. SAMA, Annual Report, 1986.

Table 2.8   TOTAL DOMESTIC EXPENDITURE GDP AND ITS COMPONENTS AT CURRENT PRICES

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
T. Expenditure	17399	22921	28256	40551	99315	139600	164526	205056	223747	248412	385806	520589	524718	415231	371246	339220	286687
T. Government Consumption	3421	3798	4285	5335	9864	15911	28883	41033	47034	56615	77563	81915	128526	126854	121803	115869	113465
Private Consumption	5859	6412	6914	7896	9827	17897	23738	34148	50995	63506	102385	114905	126514	137304	143449	141051	122074
Government Gross Fixed Capital Formation	1214	1204	1442	1785	3416	7370	17496	27350	40484	49031	61598	66874	73881	66411	53325	44699	33114
Private Fixed Capital Formation	1056	1151	1290	1669	2351	6812	10792	16740	18599	19401	23207	28691	35830	34162	41107	37734	32934
T. Government Expenditure	4635	5002	5727	7320	13280	23281	46373	68383	84518	105646	139161	148789	202407	193265	175128	160568	146579
T. Private Expenditure	6915	7563	8204	9565	12175	24704	34530	50888	69594	82907	125592	143596	162344	171466	184556	178785	145008

Source: SAMA, Annual Report, different issues, 1974-1986.

Analyzing the growth rate of the total gross expenditure components and of non-oil GDP and its sectors, we found that since 1983 the growth of nearly all these variables has followed a downward trend. To illustrate this fact and others as our analysis progresses, it will be more accurate to distinguish between the two periods, i.e. 1970-1982 and 1983-1986.

2.2.1 THE PERFORMANCE OF THE SAUDI ARABIAN ECONOMY: 1970-1982

As a consequence of the huge oil revenues which accrued to Saudi Arabia as a result of the drastic increases in oil prices during the seventies, the Saudi government launched ambitious spending programmes aiming to build the infrastructure of the economy; create structural changes in the economy and improve the well-being of its citizens. This resulted in enormous increases in the components of total gross domestic expenditure and the contribution of the non-oil sectors to GDP. As Table 2.7 shows, nominal government gross fixed capital formation, nominal government consumption, nominal private fixed capital formation and nominal private consumption increased from SR 1204, SR 3798, SR 1151 and S R 6412 million in 1971 to SR 73881, SR 28526, SR 35830 and SR 126514 million respectively in 1982, with an impressive nominal growth rate of 41.6, 35.8, 37.7 and 29.3 per cent during this period (see Tables 2.8 and 2.11). Table 2.3 shows that real non-oil GDP increased from SR 7587 million in 1970 to SR 31503 million in 1982, achieving a substantial real annual growth rate of 13.9 per cent. The growth rate of non-oil sectors and their contribution to the total GDP also increased significantly during this period. The agricultural and manufacturing sectors registered the lowest growth rate contribution to the total GDP; however, the growth rates of these sectors have increased slowly but consistently over the last ten years.

However inflation became a serious problem in Saudi Arabia during the seventies, threatening living standards. Inflation was caused mainly by supply bottlenecks, upward movement of salaries, and non-wage income and also by the monetary expansion which resulted mainly from the drastic increases in government expenditure. Inflation reached its highest level (34.4 per cent) in 1975. It was brought under control, after 1978, as a result of the reductions in government expenditure and the improvement of the infrastructure of the economy.

2.2.2 THE PERFORMANCE OF THE SAUDI ARABIAN ECONOMY: 1983-1986

Since 1982 there have been drastic reductions in government expenditure, due mainly to the substantial fall in government revenues caused by the declining price of oil. This has had undesirable effects on the economic activities of the private sector. As can be seen from Table 2.8, nominal government gross fixed capital formation, nominal government consumption, nominal private fixed capital formation and nominal private consumption decreased from SR 73881, SR 128526, SR 35830 and SR 126514 million in 1982 to SR 33114, SR 113456, SR 32939 and SR 11074 million respectively with an average nominal growth rate of -5.3, -4.0, -5.0 and -8.8 per cent during the period 1982 to 1986. The drastic decline in government and private expenditure negatively affected the non-oil economy (non-oil GDP). The real non-oil GDP fell from SR 33721 million in 1983 to SR 31762 million in 1986. Table 2.10 shows that all non-oil sectors, except the agricultural sector, registered declining growth rates during the period 1983 to 1986.

However, major physical constraints such as inadequate infrastructural projects and shortage of manpower were largely overcome by the early eighties. In addition, a high real growth rate in the non-oil GDP averaging 13.9 per cent during the period 1970 to 1982, helped

Table 2.9   GROWTH RATES OF TOTAL DOMESTIC EXPENDITURE AND ITS COMPONENTS

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
T. Expenditure	8.9	31.7	23.3	48.7	144.9	40.6	17.9	24.6	9.1	11.0	55.3	34.9	0.8	-20.8	-10.6	-8.6	-15.5
T. Government Consumption	13.0	11.0	12.8	24.5	84.9	61.3	81.5	42.0	14.6	20.4	37.0	5.6	56.9	-1.3	-3.9	-4.9	-2.0
T. Private Consumption	9.3	9.4	7.8	14.2	24.4	82.1	32.6	43.9	49.3	24.5	61.2	12.2	10.1	8.5	4.5	-1.7	-20.5
Government Gross Fixed Capital Formation	-10.	-0.8	19.8	37.7	72.1	115.7	137.3	56.4	48.0	21.1	25.6	8.6	10.5	-10.1	-19.7	-16.2	-25.9
Private Fixed Capital Formation	12.2	8.9	12.0	29.4	40.9	189.7	58.4	55.1	11.1	4.3	19.6	23.6	24.9	-4.7	20.3	-8.2	-12.7
T. Government Expenditure	5.9	5.9	19.5	27.8	81.4	74.3	99.2	47.5	23.6	25.0	31.7	6.9	36.0	-4.5	-9.4	-8.3	-8.7
T. Private Expenditure	9.7	9.3	8.5	16.6	27.3	102.9	39.8	47.3	36.8	19.1	51.5	14.3	13.1	5.6	7.6	-3.1	-18.4

Source: This table is generated from Table 2.8

Table 2.10

GROWTH OF GDP AND ITS COMPONENTS (1970-1986)

(At Constant Prices of 1970=100)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1. Gross domestic Product	9.8	14.4	15.4	19.7	15.1	0.3	8.6	15.1	5.9	6.7	10.1	7.9	1.7	-10.8	-0.7	-6.9	-8.7
2. Oil sector	18.1	20.7	21.4	24.3	15.2	-5.8	1.1	13.2	-0.5	2.3	8.5	3.3	-9.2	-36.1	-8.9	-16.5	-15.0
3. Non-Oil GDP	28.9	6.0	7.1	12.9	15.1	13.0	19.8	16.9	14.5	11.2	11.8	12.4	11.3	7.0	5.0	-2.7	-6.6
4. Agriculture, Forestry and Fishing	2.8	3.9	3.1	3.7	3.8	3.9	4.0	5.0	15.7	4.5	5.8	6.0	10.0	13.0	13.0	13.0	13.0
5. Mining and Quarrying[1]	-6.7	4.3	12.2	40.0	26.0	-15.5	36.6	19.6	9.0	14.4	2.4	19.5	37.9	-9.5	-2.6	-2.2	-1.5
6. Manufacturing[2]	12.0	12.3	12.2	10.5	10.8	8.4	14.8	15.3	15.6	15.6	15.8	15.8	15.8	16.0	13.0	-11.2	-9.7
7. Electricity, Gas and Water	10.5	9.2	10.4	15.8	9.4	-22.8	7.1	20.0	31.9	32.8	19.7	27.8	25.9	20.8	17.3	15.0	11.4
8. Construction	-3.0	21.7	11.3	18.7	36.2	75.9	39.6	27.0	10.7	5.5	3.5	12.3	30.6	-14.6	-8.7	-14.7	-20.0
9. Transport, Storage and Communication	9.0	18.1	5.2	19.8	20.3	-42.0	22.6	22.1	22.7	15.3	14.3	8.5	8.2	8.7	11.1	-0.9	-11.8
10. Other Services	3.0	3.5	7.0	11.4	12.4	26.8	16.6	13.7	13.4	12.8	14.4	12.8	3.9	13.6	2.6	-3.6	-2.0

NOTES: 1) Excluding mining of oil and natural gas   2) Excluding petroleum refining   3) Excluding growth rate

Source: 1. Saudi Arabia, Ministry of Planning, Achievements of Development Plans 1970-1986: Facts and Figures, p. 157.
         2. SAMA, Annual Report, different issues 1982-1986.

Table 2.11   GROWTH RATE OF MAJOR VARIABLES DURING THREE DIFFERENT PERIODS

	1970-1986	1970-1982	1983-1986
Total expenditure (at current prices)	12.2	34.75	-13.9
T. Government expenditure	26.6	37.1	-7.7
T. Government Consumption	26.7	35.8	-4.0
Government Cross Fixed Capital Formation	27.7	41.6	-19.9
T. Private Expenditure	22.8	30.5	-8.8
T. Private Consumption	20.3	29.3	-8.8
Private Gross Fixed Capital Formation	28.5	37.7	-5.3
GDP (at constant prices)	5.8	10.1	-6.5
Oil Sector Prices	2.1	8.7	-19.1
Non-Oil GDP (at constant prices)	10.8	13.9	-17.0
Agriculture	7.2	8.5	13.0
Mining and quarrying	11.6	15.4	-4.7
Manufacturing	10.8	13.5	2.0
Electricity, Gas and Water	14.4	15.2	16.0
Construction	13.8	22.5	-14.5
Transport, Storage and Communication	9.5	11.7	2.4

This Table (2.11) is generated from Tables 2.9 and 2.10.

the economy to emerge with substantial absorptive capacity and opened the way for the agricultural and manufacturing sectors to grow more rapidly.

In the light of the above analysis we believe that overall the Saudi economy might change, i.e. some non-oil sectors' growth rates, such as agriculture, manufacturing and the financial sector, will stabilize at a rate which can be sustained in the future, whereas in other sectors, such as construction and transport, their growth rate will actually decline as a prelude to more stable growth. In short, the Saudi economy will be more stable in the future.

2.3   THE COMPOSITION OF THE GROSS DOMESTIC PRODUCT

Due to the nature of the Saudi economy, the total GDP can be disaggregated into oil GDP and non-oil GDP. Table 2.6 shows GDP by economic sectors at constant prics for the period 1970 to 1985, and Table 2.7 presents the changes in the relative share of each sector for the same period. It is evident that the separate components of GDP grew at different rates. This may be attributed to the different emphasis in development policies adopted; the different responses of individual sectors of the economy to development efforts; the level of growth achieved; exogenous factors; or to a combination of these factors. In general, the total GDP at constant prices, increased from SR 17,153 million in 1970 to SR 53,887 million in 1982 (see Table 2.6). Obviously most of this growth was due to the substantial increases in oil prices. At the end of 1982 falling oil prices, accompanied by a low level of oil production, caused the total GDP to fall by 11 per cent in 1983, and by a further one per cent in 1984. In 1985 the total real GDP was SR 45,410 million, over 14 per cent less than the high level of 1982.

Because the Saudi economy is divided into oil and non-oil sectors, all sectors except oil are included in the non-oil sector. These include agriculture, manufacturing, construction, transport and communications, and services. The non-oil GDP increased from SR 7,587 million in 1970 to SR 31,503 million with a real average annual growth rate of 13.9 per cent. This high rate of growth reflects the Saudi government's efforts to channel oil revenues into the non-oil sector to build up a multi-based economy. In 1985, the non-oil GDP contribution to the economy was 75 per cent, compared with 35.3 per cent in 1974. Within the non-oil sector, the construction sector showed the highest growth rate, of 22.5 per cent per annum between 1970 and 1982. Since 1982 the construction sector growth rate has declined due to the completion of most infrastructural projects, mainly during the second and third five-year plans (1975-1985). Manufacturing and agriculture both experienced steady growth between 1970 and 1985, with an average growth rate of 10.8 and 7.2 per cent per annum respectively. The value of agriculture and manufacturing to the total GDP increased from SR 2,645 million and SR 431 million in 1970 to SR 2,216 and SR 2,645 million respectively in 1985. The agricultural and manufacturing sectors will be discussed in more detail in the remainder of this section.

2.3.1 THE MANUFACTURING SECTOR:

The primary objective of developing the manufacturing sector in Saudi Arabia has been to lessen the country's overwhelming dependence on oil and to diversify the sources of national income; to reduce the heavy reliance upon imports and oil exports; to increase standards of living and employment opportunities.

Although manufacturing is still in its infancy and plays a minor role in the economy, the government is determined to increase

significantly its contribution to the GDP. To this end the government provides a wide range of financial and non-financial incentives of which the major ones are: (a) pure Saudi companies are totally exempt from company taxation, paying only zakat; (b) joint-venture projects with at least 25 per cent Saudi equity participation are free from income and company taxation for a period of ten years after the start of production; (c) manufacturing companies are also exempt from customs duties on imports of raw materials, machinery and spare parts; (d) tariffs and quotas are imposed on competing imports in order to protect local industries; (e) government ministries and agencies prefer Saudi products and manufactured goods to foreign goods so long as these serve the purpose for which they are required. In addition to the above incentives, eight industrial estates have been established to offer basic infrastructure and services at minimal charges and on long-term leasing bases. To assist the private sector to achieve its role in industrial development, the government has established various financial institutions to provide long-run interest-free loans and technical assistance to private investors.

The Saudi Industrial Development Fund (SIDF) was established in 1974. The total cumulative credits disembursed by SIDF to the industrial sector reached SR 8.5 billion by the end of the 1983-84 fiscal year. The SIDF loaned SR 1.0 billion in 1983-84 an increase of 34 per cent over 1981-82 and of 23 per cent over 1982-83 (see SAMA, Annual Report, 1986). The Saudi Consultant House (SCH), is engaged in industry-oriented research, policy, formulations and planning. The Centre has been a major factor in the implementation of industrial projects through the provision of technical assistance. Joint-venture projects entered into by SABIC are financed by loans from the public investment fund which was founded in 1971. Finally, in the planning, supervision, and control of the manufacturing, the Ministry of Planning,

the Ministry of Industry and Electricity, and the Saudi Arabian Standards Organisation all play an important role.

The Saudi manufacturing sector consists of two major components: oil-based manufacturing and non-oil based manufacturing. The major industrial projects in oil-based manufacturing are large-scale projects and highly capital intensive, most being joint ventures between the government and foreign companies. Oil-based manufacturing produces mainly refined products, including petro-chemical products. Non-oil based manufacturing consists of mostly small-scale projects. The private sector owns most of the projects in this sub-sector. Construction materials, especially cement, textiles, electrical equipment, furniture, food processing and soft drinks are among the main products of non-oil based manufacturing.

2.3.2 THE AGRICULTURAL SECTOR:

Before the discovery of petroleum in the 1930s, and up to the end of the second world war when oil was exploited in commercial quantities, the Saudi Arabian economy was based on agriculture and its related activities. During that era, the agricultural sector was the main source of employment and income for the population.

Over the years dramatic structural changes took place and the economy gradually became more dependent upon oil exports. Per-capita income increased, resulting in improved standards of living. On the other hand, agricultural production became less able to keep pace with the increasing demand, a situation aggravated by the recent high growth in urbanisation. As a result, increased food imports have been used to meet the widening gap between local supply and demand. However, the government has taken various measures to achieve the following objectives: to increase agricultural output in order to maintain a

prudent level of self-sufficiency in food production; to increase the income levels of the rural population; and to ensure distribution and utilisation of the available resources for the welfare of present and future generations. The government's efforts have been channelled into various policies and programmes, including subsidies, interest-free loans, price-support, extension and research services, free land distribution, agricultural training and marketing infrastructure. By 1985 the cumulative area of free lands distributed had reached 714 thousand hectares, and the amounts provided as interest-free credit and subsidies totalled SR 19 billion and SR 9.1 billion respectively. Indeed such a large commitment from the public side to develop the agricultural sector can be justified in view of the attractive investment opportunities in other sectors and the severe constraints which face the Saudi farmers, such as harsh climate, scarcity of water and skilled labour, small size of holdings and the prevalence of traditional methods of farming.

In general, in response to the monetary and other incentives, agricultural output has greatly increased particularly in recent years. Between 1970 and 1985, the absolute value of agricultural production increased more than eleven-fold from SR 984 million to SR 11,141 million. However, in relative terms, the contribution of the agricultural sector to the total GDP is very low, not exceeding 5.7 per cent in real terms in any year. This does not mean that the agricultural sector is not important in the Saudi economy, rather that its contribution has been overshadowed by the dominant contribution of the oil sector.

2.4   THE   FOREIGN   SECTOR

Between 1970 and 1980 exports accounted for between 86 and 89 per cent of the GDP and imports ranged between 19 and 43 per cent. The Saudi Arabian kingdom is considered the tenth largest exporter in the world, accounting for between 3 and 4 per cent of the world's total exports; it is also an important importer. In 1974 it ranked 34th among the world's importers; three years later it was 11th. Apart from its importance as an exporter and importer, Saudi Arabia's accumulation of foreign assets is immense. In 1973 it held an estimated 27 per cent of the world's foreign reserves; by 1979 this had risen to 31 per cent (Third Development Plan, pp.48-9). This illustrates the significant role of Saudi Arabia in the international economy. In this section we will discuss each aspect of foreign commerce, imports and exports.

2.4.1   IMPORTS:

Since the Saudi economy is still in the process of development and industrialisation, it relies heavily on imports from many countries. It imports almost all manufactured goods and much of its food-stuffs. In the last two decades the rapid rise in imports has been influenced by many factors: for example, (a) the accumulation of massive foreign exchange receipts from oil exports, governments making it a major source of demand for imported capital goods, as well as various other imported items; (b) substantial increases in per capita incomes; (c) rapid increase in the indigenous population augmented by the influx of foreign workers; and (d) the substantial lack of industrialisation in Saudi Arabia. Given the above factors, Saudi Arabia's heavy dependency on imports is likely to continue for a considerable time.

As shown in Table 2.12 the total value of imports increased from SR 3,197 million in 1970 to SR 30,691 million in 1976. In 1982 imports increased sharply to reach a peack of SR 139,385 million. In 1983, imports decreased by 2.8 per cent and by a further 12.3 per cent in 1984 owing to the economic recesssion caused by the international oil glut and falling prices. In terms of relative total imports, the private sector is the dominant one. For instance, it accounted for an average of 72 per cent, the public sector for 24 per cent and the oil sector for 4 per cent between 1975 and 1980. Saudi Arabia's imports include a wide range of manufactured goods, particularly machinery and transport. Other significant imports being electrical equipment, motor vehicles, building materials, textiles, clothing and food-stuffs.

Japan has been the leading exporter to Saudi Arabia in recent years, with 19.15 per cent of the market in 1984, followed by USA (17.4 per cent), the Federal Republic of Germany (8.3 per cent) and France (7.8 per cent).

2.4.2 EXPORTS:

Currently, crude oil and related products account for more than 99 per cent of Saudi Arabia's exports. Other exports are mainly in the form of re-exports and a negligible amount of agricultural products to neighbouring countries. Table 2.12 shows that exports have increased at an erratic rate during the last 15 years, reflecting alternately escalating and moderating oil prices. Total exports increased from SR 10,907 million in 1970 to SR 33.309 million in 1973. In 1974 exports jumped to SR 126,223 million, mainly as a result of the drastic increases in oil prices. In 1975, exports decreased by 17 per cent over the 1974 level. In 1979, 1980 and 1981 exports increased to SR 213,183, SR 362,886 and SR 271,090 million respectively. In 1982 oil prices began to taper off, and the value of exports fell to SR 271,096 million.

Thereafter, as the oil-price decrease continued, accompanied by cuts in oil production, Saudi exports slumped to SR 122,634 million in 1985, 70 per cent less than the value of the 1981 exports. Of course this dramatic reduction in the value of exports seriously affected Saudi Arabia's economy.

2.4.3 THE BALANCE OF TRADE:

Despite Saudi Arabia's heavy reliance on imports, it has had a positive trade balance for quite a number of years since 1970. However the size of the trade surplus has been subject to considerable fluctuation. According to official reports, the trade surplus was equal to 43.6 per cent of GDP in 1970. By 1974 it had risen to 70.9 per cent and a year later it declined to 15.9 per cent. With the rapid increases in petroleum prices, the surplus again rose to about one-third of GDP in 1980. In 1983 the surplus was equal to 8.4 per cent of GDP. These fluctations in the balance of trade can be traced almost entirely to prevailing oil prices.

2.5   THE MONETARY AND FISCAL OBJECTIVES AND ACHIEVEMENT: 1970- 1985

Saudi Arabia first entered the era of planned economy in 1970. since when three five-year development plans have been completed and the fourth plan started in 1985. This section is divided into two subsections.

2.5.1 THE MONETARY AND FISCAL OBJECTIVES OF THE FIRST THREE FIVE-YEAR DEVELOPMENT PLANS:

Our aim in this subsection is to brief the reader on the monetary and fiscal authority's objectives in each developmnent plan:

Table 2.12 TOTAL EXPORTS &IMPORTS OF SAUDI ARABIA 1970-1985

(values in SR million)   (Index 1970=100)

Year	Exports[1]			Imports			
	Total Value	Index	% of Oil and its Refined Products	Total value[2]	Index	% of Consumer Products[3]	% of Producers Products[3]
1970	10,907	100	99.7	3,197	100	41.8	58.2
1971	17,303	159	99.8	3,668	115	43.0	57.0
1972	22,761	209	99.7	4,708	147	39.2	60.8
1973	33,309	305	99.6	7,310	229	37.3	62.7
1974	126,223	1157	99.7	10,149	317	37.6	62.4
1975	104,412	957	99.2	14,823	464	31.9	68.1
1976	135,154	1239	99.6	30,691	960	27.0	73.0
1977	153,209	1405	99.6	51,662	1616	27.4	72.6
1978	138,242	1267	99.2	69,180	2164	28.1	71.9
1979	213,183	1955	99.1	82,223	2572	29.5	70.5
1980	362,886	3327	99.2	100,350	3139	31.3	68.7
1981	405,481	3718	99.3	119,298	3736	31.7	68.3
1982	271,090	2485	98.8	139,335	4358	29.5	70.5
1983	167,390	1453	97.9	135,417	4236	29.5	70.5
1984	151,757	1213	97.3	118,736	3714	n.a	n.a
1985	122,034	1119	96.6	85,563	2676	n.a	n.a

Note : n.a. = not available

Sources: 1. Saudi Arabia, Ministry of Planning, Achievements of the Development Plans 1970-1984: Facts and Figures. 1985, p.175.

2. Saudia Arabia, SAMA, Annual Report, different issues, 1974-1985.

3. United Nations, Yearbook of International Trade Statistics, different issues, 1963-1983.

(a)   THE FIRST DEVELOPMENT PLAN (1970-1980):

The monetary and fiscal objective of this plan can be summarized as follows:

(i)   the principal objective of fiscal management in this plan was to evolve and implement policies and strategies which would provide the necessary resources to finance the economic development while maintaining a stable and open economy.

(ii)   to maintain foreign reserves equal to the value of imports for one and a half years.

(iii) to obtain a high rate of economic growth without adverse inflationary effects.

(iv)   to encourage private enterprise to participate effectively in the economic development through providing them with financial and physical incentives.

(v)   to prevent a potential radical swing in the value of the riyal.

(b)   THE SECOND DEVELOPMENT PLAN (1975-1980):

The main monetary and fiscal objectives of this plan can be summarized as follows:

(i)   to make available the necessary finance for the development plan in a sufficient quantity and at the right time.

(ii)   to maintain an open and stable economy, curb inflation as far as feasible, and prevent the use of the riyal as a speculative currency in the international money markets.

(iii) to transform foreign commercial banks operating in the kingdom into Saudi banks with foreign participation.

(iv)   to develop the banking system to enable it to meet the expansion in demand for banking services.

(v)   to fulfil the kingdom's international obligations and promote international cooperation and monetary policy.

(vi)   to provide sufficient financial support to private sector enterprises through specialized credit agencies; to help them become more efficient and to increase the participation of the private sector in the economic development.

(c)   **THE THIRD DEVELOPMENT PLAN (1980-1985):**

The main monetary and fiscal objectives of this plan can be summarized as follows:

(i)   to diversify the financial system and increase the range of services and financial capabilities within the country and, at the same time, to strengthen the system's effectiveness in harnessing private resources for developmental needs.

(ii)   to achieve better control over the money supply.

(iii) to develolp the capital and money market to attract the investor with a wide range of financial investment opportunities and to recycle the surplus funds of the private sector.

(iv)   to enhance the commercial banks to increase and allocate their credits sufficiently and efficiently among all sectors of the economy.

(v)   to maintain an open and stable economy, keeping inflation under control as far as feasible and preventing the riyal becoming a speculative currency in the international money markets.

(vi)   to help monetize the economy in order to facilitate capital formation.

2.5.2 THE MAJOR MONETARY AND FISCAL ACHIEVEMENTS BETWEEN 1970 AND 1985:

THE FIRST ACHIEVEMENT:

The Saudi government determined to insulate the exchange rate of the riyal from destabilizing speculative movement in the major currencies of the basket which adversely affected the Saudi economy. In March 1975 the government linked the riyal to the International Monetary Fund's special drawing right (SDRs). This change in policy - from the value of the riyal being tied to a single currency (the dollar) which is subject to severe fluctuation, to connecting it to the SDR (a unit of account consisting of a weighted average of five major currencies) - represents a very important move toward stability of the riyal and its standing against the major international currencies. The value of the riyal is now protected against significant fluctuations in any single currency.

In practice, the riyal value has been expressed in terms of the dollar mainly because the kingdom received its oil revenues in dollars. Secondly, the weight assigned to the dollar in the SDR is relatively large - approximately 33 per cent.

Table 2.13 shows the movement of the riyal against the dollar and SDR. It indicates that in 1978 the riyal began to appreciate against the dollar and continued to do so until 1980. In 1981 it became obvious that the Saudi monetary authority did not intend to allow the riyal to be overvalued against the dollar, since approximately 50 per cent of the Saudi financial system's foreign assets are denominated in dollars. In 1982, as the dollar regained an upward momentum, the Saudi monetary authority began readjusting the riyal down, and in 1983 it stood at approximately 3.45 to the dollar. In 1986 the riyal stood at 3.7033 to the dollar.

THE SECOND ACHIEVEMENT:

Because it was not possible to achieve high rates of growth without widespread price increases, and because of shortages in housing, labour and domestic supply of goods, and the enormous expansion in government expenditure, Saudi Arabia experienced high rates of inflation during the 1970s, especially in 1975 and 1976. (In 1975 and 1976 the inflation rates were approximately 34.7 and 31.5 per cent respectively). The government, in keeping with its prime objective of improving the well-being of the people, took a number of measures to mitigate this situation. It abolished a number of taxes and reduced others. For example, the road tax and taxes on domestic petroleum products were eliminated. Many customs duties were also eliminated and tariffs on the remainder were reduced to a token 3 per cent. Other important measures taken, either to reduce or to offset the rise in living costs, included a number of import subsidies on milk and milk products, and on medicines. The government also began a programme to encourage bulk imports of certain products to reduce pressure on price increases. The government also reduced the cost of electricity from 20 halalahs (the smallest currency unit in Saudi Arabia) to 14 halalahs ker Kwh. On 19th August 1974, it again reduced the cost of electrcity to 7 halalahs (US$ 0.02) for domestic consumption and 5 halahahs for industrial consumption.

At the beginning of 1973, and again at the beginning of 1975, the government granted substantial wage increases throughout the public sector, the higher increases going to the lower paid categories.

These measures, together with the reduction in government expenditure and increases in the aggregate supply, brought inflation in Saudi Arabia under control. Inflation dropped dramatically from 34.7 per cent in 1975 to 3.7 per cent in 1980. In 1984, inflation reached its lowest level (-3.4 per cent).

THE THIRD ACHIEVEMENT:

The bank Saudization programme began in 1976 and was completed in 1980. The programme aimed to transform branches of foreign commercial banks operating in the Kingdom into Saudi joint stock companies with foreign participation. The process by which the foreign banks became Saudi banks was based on the calculation of the book value of eachforeign bank, which was then set at 40 per cent of the capital of the new bank, the foreign bank retaining a 40 per cent ownership in each case. The remaining 60 per cent of the capital was allocated between the Board of Saudi Sponsor (24 per cent) and the Saudi Public (36 per cent).

The main objectives of this programme were to improve the range and quality of the banking services through greater competition among a larger number of national banks, and to ensure that the banking system remained in the hands of indigenous Saudis.

THE FOURTH ACHIEVEMENT:

Two important steps were taken by the monetary authority in the early 1980s in order to increase its ability to control the money supply (the gross private domestic liquidity). Firstly the monetary authority introduced a programme called the Bankers' Security Deposit Account (BSDA). This enabled the commercial banks to hold securities (with different maturities and interest rates) issued by SAMA. This programme was considered to be the first step towards creating a fixed-interest securities' market and we will examine this in more detail in the next chapter. Secondly, the money changers' activities, such as their domestic lending, their transfer of capital abroad, and acting as a bank on occasions, posed a serious threat to SAMA's ability to control the money supply. Consequently, in January 1982 SAMA introduced a number of measures to regulate the money changers' activities, the most important

Table 2.13 THE EXCHANGE RATE OF RIYAL AGAINST THE DOLLAR AND SDR

	S. Riyal/U.S. Dollar	S. Riyal/SDR	U.S. Dollar/SDR
1975	3.5176	4.272335	1.21415
1976	3.5300	4.075608	1.154521
1977	3.5251	9.115433	1.167521
1978	3.3996	4.282340	1.25200
1979	3.3608	4.343038	1.29200
1980	3.3267	4.330570	1.30153
1981	3.3825	3.990027	1.17916
1982	3.4282	3.786944	1.10401
1983	3.4548	3.692904	1.06960
1984	3.5238	3.610328	1.02501
1985	3.6221	3.681722	1.01534
1986	3.7033	4.348328	1.17317

Sources: 1. SAMA, Money and Banking Statistics, 1st Quarter, 1987, Table 34(b) and Table 34(c).

one being that they were required to apply for a licence, and that such licences should be renewed every six months.

THE FIFTH ACHIEVEMENT:

Between 1971 and 1974, the government established six government funding institutions, their role being to provide medium and long-term interest-free loans to different sectors of the economy in order to promote economic development.

Their total assets - capital, reserve, and total loans - witnessed remarkable growth between 1976 and 1986 from SR 17.6, SR 15.4 and SR 5.7 billion respectively in 1976 to SR 185.4, SR 177.8 and SR 17.5 billion respectively in 1985 (see SAMA Annual Report, 1976, p.136; 1986, p.184). This reflects the important role of these institutions in the Saudi financial system. In the next chapter these institutions will be discussed in more detail.

CONCLUSION

The discussion in this chapter is focussed on some features of the Saudi economy, especially those which are related to the Saudi monetary sector. For example:

(1)   Saudi Arabia has an open economy with complete capital mobility.

(2)   The oil revenue represents the main source of income, foreign exchange and government revenue in Saudi Arabia.

(3)   The government expenditure is the most important factor in the development process of the Saudi economy, in stimulating the economic activities of the private sector and in affecting the monetary aggregate.

In this chapter we also discuss the performance of the Saudi economy. Our discussion shows that, during 1970-1986, the Saudi economy experienced two different stages. In the first stage (1973-1982) which represented the oil-boom years, all the major economic and monetary indicators, such as the components of non-oil GDP and total gross domestic expenditure and monetary aggregates, experienced remarkable growth. In the second stage these indicators registered low growth rates, due to the noticeable decreases in domestic government expenditure resulting from a sharp decline in oil revenue and the completion of major development projects.

Finally, in this chapter we highlight the monetary and fiscal objectives of the first three Saudi development plans (1970-1985) and shed some light on the major monetary and fiscal achievements during 1970-1985 in Saudi Arabia.

CHAPTER   III

THE   SAUDI   ARABIAN   MONETARY   SYTEM

INTRODUCTION

Since the early 1970s the monetary and banking system in Saudi Arabia has experienced substantial development. This is largely due to the sharp increase in oil revenue and the corresponding expansion in government expenditure.

In this chapter an attempt is made to provide a clear picture of the Saudi monetary system. Section one provides an evaluation of the monetary and banking development. In section two the main characteristics of the money market in the developed and less-developed countries are discussed. Section three then examines the Saudi market, focussing on its nature and the main obstacles facing it. In section four the financial institutions are discussed in detail, while section five describes the Riyal off-shore market in Bahrain.

3.1 MONETARY AND BANKING DEVELOPMENT IN SAUDI ARABIA, 1971-1986

Sharp increases in oil revenue and the corresponding expansion in government expenditure during the 1970s had a considerable effect on the monetary and banking sectors in Saudi Arabia. These sectors have experienced significant development since 1971. This section gives an evaluation of the monetary and banking development in the period 1971 to 1986. The evaluation is based on tracing the growth of the major financial and monetary indicators of the Saudi financial system, such as the total assets/liabilities of Saudi financial institutions; the total foreign assets of SAMA (Saudi Arabian Monetary Agency) and the commercial banks; the total capital and reserves of the commercial banks and specialized credit institutions; the total deposits of the commercial banks; the total credits of the commercial banks and specialized credit institutions; and the monetary aggregates, i.e. the money supply narrowly defined or M_1 (consisting of currency in circulation of the non-bank public and demand deposits), the money supply broadly defined as M_2 (consisting of M_1 plus riyal time and saving deposits) and, lastly, the gross private sector liquidity or M_3 (encompassing M_2 plus other quasi-monetary deposits which include deposits for letters of credit, deposits for letters of guarantee, and resident foreign deposit. The evaluation is also based on tracing the movement of several selective financial ratios (see Goldsmith 1967 and Al-Jasser 1986) such as the share of the gross private sector's liquidity components in the money supply (M_3), the monetary aggregates and total deposits - GDP ratios, income velocity and the commercial banks' claims on the private sector - GDP ratios. These ratios are usually used as measures of the monetary and banking development, the importance or 'real size' of the monetary system in the economy and the size of the organized money market.

Tables 3.1 - 3.5 show the remarkable expansion in the major indicators of the Saudi financial system during the 1970s and early 1980s. The tables show that the total assets/liabilities of Saudi financial institutions, the total foreign assets of SAMA and the commercial banks, the total capital and reserves of the commercial banks and specialized credit institutions, the total deposits in the commercial banks, the total credits of the commercial banks and specialized credit institutions, increased at the substantial annual growth rate of 25.9, 41.1, 41.1, 41.8 and 39.2 per cent respectively during the period 1975 to 1982. The tables also indicate that between 1983 and 1986 these indicators experienced significantly low, and in some cases, negative, growth rates. The low growth rates can be attributed to the sharp drop in oil revenue and the resultant drastic cuts in government expenditure.

The money supply, M_3 achieved enormous increases both in absolute and relative terms (see Tables 3.6 and 3.7), especially in the 1970s and early 1980s. During the period 1971 to 1982 a remarkably high annual growth rate of 36.6 per cent was recorded. According to the SAMA <u>Annual Report</u> 1986, the money supply in Saudi Arabia was influenced mainly by the following factors: (1) the cash flow through government expenditure; (2) the commercial banks' claims on the private sector; and (3) the net private sector balance of payments. That is the Saudi private sector import values plus its investment abroad minus the private sector export values plus its returns from foreign investment. The Saudi private sector balance of payments has always been in deficit. Table 3.8 clearly shows the relationship between these factors and the money supply. It shows that the growth of government expenditure and the commercial banks' claims on the private sector followed almost the same trend between 1971 and 1986. The same table also shows that since 1983, the money supply, government expenditure, and the commercial banks' claims on the private sector have had considerably lower growth rates.

The money supply's components experienced enormous growth especially in the 1970s and early 1980s. The currency in circulation and demand deposits also expanded greatly between 1971 and 1986, growing at an annual rate of 29.7 and 42.8 per cent respectively during the period 1971 to 1982 (see Table 3.7). Their high rates of expansion can be attributed largely to sharp increases in government expenditure and the corresponding high growth in income, high rates of inflation, lack of effective channels for foreign financial investment and limited domestic financial investment opportunities. The time and saving deposits and other quasi-monetary deposits (other quasi-monetary deposits being mainly foreign currency deposits, deposits against letters of credit and guarantees) grew at a substantial annual growth rate of 45.4 and 40.9 per cent respectively throughout the 1971-1982 period. These high rates of growth can be attributed to the following factors: (1) increased levels of income; (2) the expansion of the banking system and the growth of the banking habit among the people; (3) high levels of riyal and foreign interest rates, especially during 1978 to 1983 (see Table 3.9).

Between 1971 and 1979 the share of currency in circulation and demand deposits in the money supply (M_3) fluctuated between 33.5 and 46.7 per cent and 27.5 and 51.0 per cent respectively (see Table 3.10). Since 1979, their share in the money supply (M_3) has declined gradually in favour of quasi-money (consisting of time and saving deposits plus other quasi-monetary deposits) • Table 3.10 shows how the share of quasi-money in the money supply (M_3) has increased gradually since 1979. This increase is largely due to the increasing ability of the Saudi financial system to handle new pressures and to absorb more funds as a result of the rapid improvement in the commercial banks' financial activities and services, and the expanding capacity of the banking system.

Table 3.11 shows how the movement of the gross domestic private sector's liquidity components, the monetary aggregate and total deposits - GDP ratios. M_1 - GDP ratio increased noticeably between 1974 and 1979. The increases in M_1 - GDP ratio during that period were largely due to the enormous expansion in government expenditure and the high rates of inflation. In the same period (1974-1979), the time and saving deposits and other quasi-monetary deposits - GDP ratios were low and their changes (increases) were also low, the differences between M_1, M_2 and M_3 - GDP ratio being insignificant. Tables 3.11 and 3.12 indicate that since 1980 the M_1 - GDP ratio has risen slowly whereas the M_2 and M_3 - GDP ratio has increased much faster. In addition, the total deposits and the commercial banks' claims on the private sector have increased substantially. The movement of these ratios after 1980 reflect the accelerated monetary and banking development and the essential expansion of the Saudi monetary system.

Table 3.12 shows how the income velocity of money has declined steadily since 1980. This could well be attributable to the fast decline in inflation, increasing monetisation of the Saudi economy and the rising demand for a real balance resulting from the high growth rate of the real non-oil GDP.

3.2 THE MONEY MARKET IN THE DEVELOPED AND LESS-DEVELOPED COUNTRIES

In this section the main characteristics of the money market in the developed and in the less-developed countries will be discussed. These characteristics will be presented through a comparison of the respective money markets. Firstly, however, it is appropriate to define the money market and specify briefly the functions which can be carried out by a developed money market.

Generally speaking, the money market means a market where the transactions are confined to lending and borrowing of short-term funds. The lending and borrowing could be carried out through the use of bills of exchange, short-term government security, banking acceptance, etc. A well-developed money market should be capable of performing essential functions in the economy. These functions, according to Ghatak, S. (1981) are:

(a) It allocates saving into investment and tends to obtain an equilibrium between the demand for money and supply of loanable funds. Such an action of the money market leads to a more rational allocation;

(b) A developed money market promotes liquidity and safety of financial assets and thereby it encourages saving and investment.

(c) A developed money market promotes financial mobility by enabling the transfer of funds from one section to another. Such a flow of funds is regarded as essential for the growth of the economy and commerce. Elasticity in the flow of funds is thus provided by the market.

(d) A developed money market is essential for the successful implementation of the monetary policies of the Central bank.

In less-developed countries, the organized money market exists side by side with the unorganized money market. The direct connection between the two is rather poor and not so close as the connection between the organized money market and the world money market. The unorganized money market consists of a few financial institutions such as cooperatives, private and government-sponsored aggricultural banks, indigenous banks, professional money-lenders, large traders, landlords,

shopkeepers, relatives and friends. These institutions are completely outside the control of the Central bank. The organized money market consists of the commercial banks and the Central bank. There are hardly any lending agencies of importance other than the commercial banks. There are no discount houses, acceptance houses, or saving institutions (including life insurance companies). By contrast, the money market in the developed countries contains not only the commercial banks and the Central bank, but also other lending agencies, such as discount houses or acceptance houses, and saving institutions including life insurance companies. These financial institutions together with commercial banks, lead to increases in the availability of credits and reduce interest rate.

The financial institutions of a developed money market are highly organized, efficient and up-to-date with branches throughout the country. Moreover, they have close and intimate contacts with Central bank and between themselves; therefore the Central bank can regulate the flow of credit and control the interest rate more effectively. By contrast, the financial institutions in less-developed countries are unorganized and inefficient and lag far behind the financial institutions in the developed countries in terms of financial activities, services, management and techology.

There are rather rigid relations between financial institutions in a developed money market. For instance, in the British money market, the bank rate charged by the Bank of England for rediscounting eligible commercial paper, the market rates of interest (i.e. the rate of interest charged by the discount house for holding bills of exchange), the call money rate charged by commercial banks for very short-term lending on the discount market, and the time deposit rate of interest offered by the commercial banks and savings institution, are very

Table 3.1   TOTAL ASSETS/LIABILITIES OF SAUDI FINANCIAL INSTITUTIONS
(In SR billion)

	Specialized Credit Agencies' Total Assets /Liabilities (1)	Growth Rate	SAMA's Total Assets and Liabilities (2)	Growth Rate	Commercial Banks' Total Assets and Liabilities (3)	Growth Rate	Total Assets/ Liabilities of Saudi Financial Institutions (1+2+3)	Growth Rate
1975	1.1	57.1	130.0	30	15.7	73.5	146.8	25.5
1976	17.6	15.00	170.6	31.2	27.8	83.9	216.0	48.0
1977	37.7	119.2	197.4	15.7	41.9	62.2	277.0	28.2
1978	53.9	43.0	197.1	-0.15	56.9	49.0	307.9	11.1
1979	70.1	30.0	185.6	-5.8	62.1	0.19	317.8	3.2
1980	92.4	31.8	222.3	19.8	73.9	24.5	388.6	22.3
1981	114.5	23.9	320.1	44.0	106.4	42.9	541.0	39.2
1982	140.5	22.9	434.6	35.8	126.0	25.7	701.1	29.6
1983	157.6	12.2	416.2	-4.2	129.1	17.3	702.9	0.3
1984	175.5	11.9	383.0	8.0	146.3	5.1	704.8	0.3
1985	185.4	5.6	341.7	-10.3	150.3	5.1	677.4	-4.0
1986	189.9	2.4	310.5	-9.1	161.0	1.2	661.4	-2.4
Annual growth rate 1976-86		154.5%		13.0%		32.5%		16.6%
Annual growth rate 1976-82		227.9%		21.3%		45.2%		25.9%
Annual growth rate 1983-86		7.9%		-3.9%		7.2%		-1.45%

Sources: 1. SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table 6(a) and Table 9(a).
2. SAMA, Annual Report, different issues, 1978-1986.

Table 3.2   TOTAL FOREIGN ASSETS OF SAMA AND COMMERCIAL BANKS (In SR billion)

	Foreign Assets of Commercial Banks (1)	Growth Rate	Foreign Assets of SAMA (2)	Growth Rate	Total Foreign Assets (1+2)	Growth Rate
1975	2.4	60.0	76.8	91.0	79.2	89.9
1976	5.4	55.6	136.4	77.6	141.8	79.6
1977	9.4	74.1	211.8	55.3	221.2	56.0
1978	14.2	56.4	185.2	12.6	199.9	-9.6
1979	17.0	15.6	231.4	24.9	248.4	24.3
1980	23.9	40.6	277.6	19.9	301.5	21.4
1981	41.0	71.5	418.5	50.8	459.5	52.4
1982	53.6	30.7	477.5	14.1	531.1	15.6
1983	66.0	23.1	438.7	-0.81	504.7	-5.6
1984	71.1	7.7	395.7	-9.8	466.8	-7.5
1985	73.4	3.2	356.4	-9.9	429.8	-7.9
1986	72.8	-0.8	318.9	-10.5	391.7	-9.7
Annual growth rate 1975-86	36.5%			26.3%		24.9%
Annual growth rate 1975-82	50.6%			43.3%		41.1%
Annual growth rate 1983-86	8.3%			-7.8%		7.5%

Note: SAMA's foreign assets are obtained by adding together the following components of its balance sheet: gold, convertible foreign currencies, deposits with banks abroad, investment in foreign securities and gold and silver.

Source: 1.   SAMA, Annual Report, different issues, 1976-86.
           2.   SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table 1(k).

53

Table 3.3 TOTAL CAPITAL AND RESERVE OF THE COMMERCIAL BANKS AND SPECIALIZED CREDIT INSTITUTIONS
(In SR millions)

	Capital and Reserve of the Commercial Banks (1)	Growth Rate	Capital and Reserve of the Specialized Credit Institutions (2)	Growth Rate	Total Capital and Reserves of the Commercial Banks and Specialized Credit Institutions (1+2)	Growth Rate
1974	n.a.	n.a.	10011.0	n.a.	10359.0	n.a
1975	679	95.1	13250.0	32.3	13929.0	34.5
1976	942	38.7	15433.6	16.5	16375.6	17.6
1977	1114	38.0	22960.0	48.7	24074.0	47.0
1978	1360	22.1	38021.1	65.6	39381.1	30.3
1979	1990	46.3	49341.1	29.8	51331.1	74.9
1980	3520	76.9	86304.3	74.9	89824.3	75.0
1981	4840	37.5	107256.5	24.3	112096.5	24.8
1982	6615	36.7	133412.6	24.4	140027.5	24.9
1983	8513	28.7	148421.5	11.2	156934.5	(12.1)
1984	10038	17.9	165892.8	11.8	175930.8	(12.1)
1985	11893	18.5	177773.8	7.2	189666.8	7.8
1986	13156	10.8	184723.8	3.9	197879.8	4.3
Annual growth rate 1975-86	38.9%		29.2%		30.4%	
Annual growth rate 1975-82	48.9%		39.6%		41.1%	
Annual growth rate 1983-86	18.9%		8.5%		9.1%	

Sources: 1. SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table 6(c) and 9(c).
2. SAMA, Annual Report, different issues, 1978-1986.

Note: n.a. = not available

Table 3.4   THE COMMERCIAL BANKS' TOTAL DEPOSITS
(In SR million)

	Monetary Deposits (1)	Growth Rate	Quasi-monetary Deposits (2)	Growth Rate	Total Deposits (1+2)	Growth Rate
1971	1007	13.8	1109	27.6	2116	21.8
1972	1465	31.3	1397	28.0	2865	35.4
1973	2311	57.7	1766	26.4	4077	42.3
1974	3711	60.5	2630	48.9	6341	55.3
1975	7427	100.1	3875	47.3	11302	78.2
1976	13607	83.2	5758	48.6	19365	71.3
1977	20793	52.8	7910	37.4	28703	48.2
1978	27764	33.5	9567	29.9	37331	30.0
1979	30198	8.8	13766	43.9	43964	17.8
1980	33295	10.3	21346	55.1	54641	24.2
1981	39064	17.3	35682	67.2	74746	36.8
1982	48398	23.8	47022	31.8	95420	27.7
1983	50457	4.3	48092	2.3	93549	3.3
1984	48838	-3.2	61446	27.8	110284	11.9
1985	47564	-2.6	63004	2.5	110568	0.25
1986	45000	-5.4	70254	11.5	115254	4.2

Annual growth rate 1971-1986		32.4%		33.5%		31.8%
Annual growth rate 1975-1982		41.2%		45.15%		41.8%
Annual growth rate 1983-1986		-1.7%		11.0%		4.9%
Annual growth rate 1975-1986		26.9%		33.8%		29.5%

Note: Monetary deposits = Business and individual deposits + official entities deposits.
Quasi-monetary deposits = Savings and time deposits + other quasi-monetary deposits.

Sources: 1.   SAMA, Annual Report, different issues, 1976-1986.
2.   SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table

Table 3.5   THE COMMERCIAL BANKS' CLAIMS ON THE PRIVATE SECTOR AND
THE CREDITS OF THE SPECIALIZED CREDIT INSTITUTIONS TO PRIVATE SECTOR

	Commercial Banks' Loans (1)	Growth Rate	Invest-ment (2)	Commercial Banks' Claims on the Private Sector 1+2 (3)	Growth Rate	Credits of Specialised Institutions (4)	Growth Rate	Total Credits	Growth Rate
1975	6512	56.0	210	6722	48.7	2000	29.0	8512	80.5
1976	9638	48.0	246	9884	47.0	5722	186	15361	65.2
1977	9714	0.79	405	10118	2.4	15664	173.0	25378	32.0
1978	13951	44.0	533	14484	30.1	19560	24.9	33511	26.3
1979	25054	79.6	807	25861	78.5	17267	11.7	42321	25.7
1980	34199	36.5	702	34919	35.1	19014	10.1	53213	25.7
1981	42276	23.6	872	43148	23.5	22365	17.1	64641	21.5
1982	49290	16.6	1245	50535	17.1	24025	7.4	73315	13.4
1983	55201	11.9	1000	56201	10.1	26470	10.2	81671	11.4
1984	58061	5.2	1254	59315	5.5	23563	-10.9	81624	-0.06
1985	59092	1.7	1331	60423	1.9	17465	-25.9	76557	-6.2
1986	55688	-0.6	1559	60247	-0.3	10879	-37.3	69567	-9.1
Annual growth rate 1975-86		26%			24.9%		33%		23/9%
Annual growth rate 1975-82		38%			35.3%		57.5%		36.3%
Annual growth rate 1983-86		4.6%			4.3%		15.7%		-0.99%

Sources: 1.   SAMA, Annual Report, different issues 1976-1986.
            2.   SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table 6(a).

Table 3.6   MONEY SUPPLY,(M₃) AND ITS COMPONENTS
(In SR million)

	CC	DD	T&SD	OQMD	TQMD	M_1 1+2	M_2 5+3	M_3 6+4
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1971	1641.6	967.9	565.3	343.4	908.7	3609.5	3174.8	3518.2
1972	1951.2	1309.4	737.8	482.7	1220.5	3260.6	3998.4	4481.1
1973	2487.8	2259.3	814.3	656.4	1470.7	4747.1	5561.4	6217.8
1974	3374.4	3195.2	913.5	1248.1	2161.6	6569.6	7483.1	8731.2
1975	5051.6	5632.5	1539.1	1836.6	3375.7	10684.1	12223.2	14059.8
1976	8558.5	11011.8	1571.9	3310.4	4882.3	19570.3	21142.2	24452.6
1977	13607.7	17609.6	1810.6	4307.6	6118.2	31217.3	33027.9	37335.5
1978	17969.6	27327.4	3060.2	5259.9	8320.1	45297.0	48357.2	53617.1
1979	21009.6	29476.3	4165.2	6728.8	10894.0	50485.9	54651.1	61379.9
1980	25198.8	30448.5	11630.0	7511.1	19141.2	55647.3	67177.3	74788.5
1981	26143.8	37265.4	19994.2	10976.8	30971.0	63409.2	83403.4	94380.2
1982	30421.1	46166.6	26367.0	16490.0	42857.0	76587.7	102954.7	119444.7
1983	35280.6	51761.7	24050.3	18305.3	47355.6	87042.5	116092.8	134398.1
1984	34654.9	51666.5	33575.4	24050.7	57626.1	86321.4	119896.8	143947.5
1985	34749.8	48360.7	36589.4	29196.4	65785.8	83110.5	119699.9	148896.3
1986	36867.8	46170.8	39682.1	27519.0	67201.1	83038.6	122720.7	150239.7

Notes:

CC   = Currency in Circulation
DD   = Demand Deposits
T&SD = Time and Saving Deposits
OQMD = Other Quasi-Monetary Deposits
TQMD = Total Quasi-Monetary Deposits

Sources:

1. SAMA, Annual Report, different issues, 1975-1986.
2. SAMA, Money and Banking Statistics, 1st Quarter 1986 and 3rd Quarter 1987, Table 1(c).

Table 3.7   THE PERCENTAGE CHANGE OF THE MONEY SUPPLY'S COMPONENTS, THE MONETARY AGGREGATES, THE GOVERNMENT EXPENDITURE, THE GROSS DOMESTIC PRODUCT AND INFLATION RATE

	CC (1)	DD (2)	T&SD (3)	OQMD (4)	M_1 1+2 (5)	M $5+3^2$ (6)	M $6+4^3$ (7)	GOV. EXP.	GDP	CBCPS	INFL. RATE
1971	7.4	19.2	17.4	9.0	11.5	12.5	12.1	4.4	6.0	5.5	4.86
1972	18.4	35.3	30.5	40.6	25.0	25.9	27.9	29.2	7.1	1.2	4.3
1973	27.5	72.5	10.4	36.0	45.6	39.1	38.8	24.9	12.9	34.7	13.9
1974	35.6	41.4	12.2	90.1	38.4	34.6	40.4	83.1	15.1	88.4	21.5
1975	49.7	76.3	68.5	47.2	62.6	63.3	61.0	88.4	13.0	48.7	34.7
1976	69.4	95.5	2.1	80.2	83.2	73.0	73.9	133.4	19.8	47.0	31.5
1977	59.0	59.9	15.2	30.1	59.5	56.2	52.7	30.5	16.9	2.4	11.2
1978	32.	55.2	69.0	22.1	45.1	46.4	43.6	28.5	14.5	30.1	11.2
1979	16.9	7.9	36.1	27.9	11.5	13.0	14.5	6.7	11.2	78.5	1.9
1980	19.9	3.3	179.2	11.6	10.2	23.1	21.8	27.0	11.8	35.1	3.6
1981	3.8	22.4	71.9	46.1	13.9	24.0	26.2	24.1	12.4	23.5	2.9
1982	16.4	23.9	31.9	50.2	20.8	23.4	26.6	22.9	11.3	17.1	1.12
1983	16.0	12.1	10.2	11.0	13.7	12.8	12.5	-13.5	7.0	10.1	0.8
1984	-1.8	0.2	15.6	31.4	-0.8	3.3	7.1	-6.0	5.0	5.5	-1.2
1985	0.3	-6.9	9.0	21.4	-3.7	-0.2	3.4	-16.1	-2.7	1.9	-3.2
1986	6.1	-4.5	8.5	-5.8	-0.1	-2.5	0.9	-28.2	-6.0	-0.3	-3.0

Annual growth rate 1971-86

	CC	DD	T&SD	OQMD	M_1	M	M	GOV.EXP.	GDP	CBCPS
	23.5%	32.1%	36.7%	34.3%	27.3%	27.9%	28.9%	27.9%	9.73%	26.8%

Annual growth rate 1971-82

	CC	DD	T&SD	OQMD	M_1	M	M	GOV.EXP.	GDP	CBCPS
	29.7%	42.7%	45.4%	40.9%	35.6%	36.2%	36.6%	41.9%	12.7%	34.4%

Annual growth rate 1983-86

	CC	DD	T&SD	OQMD	M_1	M	M	GOV.EXP.	GDP	CBCPS
	5.5%	0.35%	10.8%	14.5%	2.3%	3.9%	6.%	-15.9%	0.83%	4.3%

Key to Abbreviations:
CC   Currency in Circulation
DD   Demand Deposits
T&SD   Time and Saving Deposits
OQMD   Other Quasi-monetary Deposits
GOV.EXP.   Government Expenditure
GDP   Gross Domestic Product
CBCPS   Commercial Banks' Claims on the Private Sector
INFL.RATE   Inflation Rate

Sources: 1.   SAMA, Annual Report, different issues, 1974-1986.
           2.   SAMA, Monetary and Banking Statistics 3rd Quarter, 1987, Table 4(c).
           3.   Saudi Arabia Ministry of Planning, Achievement of Development Plans 1970-1984: Facts and Figures, p. 182.

Table 3.8 PERCENTAGE CHANGES OF THE MONETARY AGGREGATES, THE GOVERNMENT EXPENDITURE THE COMMERCIAL BANKS' CLAIMS ON THE PRIVATE SECTOR, AND THE NET PRIVATE SECTOR BALANCE OF PAYMENTS DEFICIT IN SAUDI ARABIA

	M_1	M_2	M_3	Government Expenditure	Commercial Banks' Claims on the Private Sector	Net Private Sector Balance of Payments Deficit
1971	11.5	12.5	12.1	4.4	4.4	N.a.
1972	25.0	25.9	27.4	29.2	-0.2	N.a.
1973	45.6	39.1	38.8	24.9	6.9	N.a.
1974	38.4	34.6	40.4	83.1	77	N.a.
1975	62	63.3	61.0	88.9	68.7	N.a.
1976	83.2	73.0	73.9	133.4	47.0	141.9
1977	59.5	56.2	52.7	30.5	2.4	35.8
1978	45.1	46.4	43.6	28.5	30.1	72.8
1979	11.5	13.0	14.5	6.7	76.0	15.6
1980	10.5	23.1	21.8	27.0	48.1	30.2
1981	13.9	24.0	26.2	24.1	37.7	15.3
1982	20.8	23.4	26.6	22.9	15.7	-2.7
1983	13.7	12.8	12.5	-13.5	6.1	-13.2
1984	-0.8	3.3	7.1	-6.0	13.4	-7.6
1985	-3.7	-0.2	3.4	-16.1	5.9	-7.6
1986	-0.1	-2.5	0.9	-28.2	-2.0	-21.7

N.a. = Not available

Sources: 1. SAMA, Annual Report, different issues, 1971-1986.
          2. SAMA, Money and banking Statistics 3rd Quarter 1987, Table 4(b).

Table 3.9 THE PERCENTAGE CHANGE OF THE MONEY SUPPLY'S COMPONENTS AND THE RIYAL AND U.S. DOLLAR INTEREST RATE

	Currency in Circulation	Demand Deposits	Time and Saving Deposits	Other Quasi-Monetary Deposits	Foreign Deposits	Foreign Interest Rate U.S. Dollar Interest Rate	Riyal Interest Rate
1975	49.7	76.3	68.3	47.1	n.a.	n.a.	n.a
1976	69.9	95.5	2.1	80.2	n.a.	6.61	6.0
1977	59.0	59.9	15.2	30.1	32.42	6.91	4.50
1978	32.0	55.2	69.0	22.1	32.25	9.78	4.90
1979	16.9	7.9	36.1	27.9	54.20	11.67	8.72
1980	19.9	3.3	17.92	11.6	107.88	14.08	12.84
1981	3.8	22.4	71.9	46.1	66.9	15.83	14.13
1982	16.4	23.4	31.4	50.2	69.61	13.36	12.56
1983	16.0	12.1	10.2	11.0	16.63	10.22	10.13
1984	-1.0	0.2	15.6	31.4	60.97	11.72	10.10
1985	0.3	-6.4	9.0	21.4	12.91	8.84	9.13
1986	6.1	-4.5	8.5	-5.8	12.24	6.6	7.78

N.B.   n.a. = not available

Source: 1.   SAMA, Annual Report, different issues, 1976-1986.
2.   Riyal and U.S. dollar interest rates were obtained from several Saudi commerial banks and from SAMA.

Table 3.10   THE PERCENTAGE SHARE OF THE COMPONENTS OF THE GROSS PRIVATE DOMESTIC LIQUIDITY IN MONEY SUPPLY M_3

	Currency in Circulation (1)	Demand Deposits (2)	Time and Saving Deposits (3)	Other Quasi-Monetary Deposits (4)	Total Quasi-Monetary Deposits (3+4) (5)	Total Deposits (2+5) (6)
1971	46.7	27.5	16.0	9.8	25.8	53.3
1972	93.5	29.2	16.5	10.7	27.2	56.4
1973	40.0	36.3	13.1	10.6	23.7	60.0
1974	38.6	36.6	10.5	14.3	24.8	61.4
1975	35.9	40.0	10.9	13.1	24.	64.0
1976	35.0	48.0	6.4	13.6	20.0	65.0
1977	36.4	47.2	4.8	11.6	16.4	63.6
1978	33.5	51.0	5.7	9.8	15.5	66.5
1979	34.2	48.0	6.8	11.0	17.8	65.8
1980	33.7	40.2	15.6	10.0	25.6	66.3
1981	27.7	39.5	21.2	11.6	32.8	72.3
1982	25.5	38.7	22.0	13.8	35.8	74.5
1983	26.3	38.5	21.6	13.6	35.2	73.7
1984	24.1	35.9	23.3	16.7	40.	75.9
1985	23.3	32.5	24.6	19.6	44.2	76.7
1986	24.5	30.7	26.4	18.4	44.8	75.5
1987	24.1	29.6	25.5	20.8	46.3	75.9

Sources: 1.   SAMA, Annual Report, different issues, 1975-1986.
            2.   SAMA, Money and Banking Statistics, 3rd Quarter, 1987, Table 1(p).

Table 3.11 THE RATIOS OF MONEY SUPPLY'S COMPONENTS AND MONETARY AGGREGATES TO GDP

	CC/GDP ratio	DD/GDP ratio	T&SD/GDP ratio	OQMD/GDP ratio	TQMD/GDP ratio	M_1/GDP ratio	M_2/GDP ratio	M_3/GDP ratio
1971	7.2	4.2	2.5	1.5	4.0	11.9	13.9	12.6
1972	6.9	4.6	2.6	1.7	4.3	11.5	10.0	11.2
1973	6.1	5.6	2.0	1.6	3.6	11.7	5.6	6.3
1974	3.4	3.2	0.9	1.2	2.1	6.6	5.6	6.5
1975	3.6	4.0	1.1	1.3	2.4	7.6	8.8	10.1
1976	5.2	6.7	0.96	2.0	2.96	11.9	12.9	14.9
1977	6.7	8.6	0.89	2.1	2.99	15.3	16.2	18.3
1978	8.1	12.3	1.4	2.4	3.8	20.4	21.6	24.2
1979	8.2	11.5	1.6	2.6	4.2	19.7	22.1	24.8
1980	6.6	7.9	3.0	2.0	5.0	14.5	17.5	19.5
1981	5.0	7.2	3.9	2.1	6.0	12.2	16.1	18.2
1982	5.8	8.8	5.0	3.2	8.2	14.6	19.7	22.8
1983	8.6	12.6	7.1	4.4	11.5	21.2	28.2	32.7
1984	9.4	14.0	10.9	6.5	17.4	23.4	32.5	40.8
1985	10.6	14.8	11.2	8.9	20.1	25.0	36.6	45.5
1986	13.0	16.3	14.0	9.7	23.7	29.0	43.4	53.0

Note:
CC   = Currency in Circulation
DD   = Demand Deposits
T&SD = Time and Saving Deposits
OQMD = Other Quasi-Monetary Deposits
TQMD = Total Quasi-Monetary Deposits

Sources:
1. SAMA, Annual Report, different issues, 1975-1986.
2. SAMA, Money and Banking Statistics, 1st Quarter, 1987, Table 6(f).

Table 3.12   **THE RATIOS OF THE TOTAL DEPOSITS AND COMMERCIAL BANKS'**
CLAIMS ON THE PRIVATE SECTOR TO GDP

	Total Deposit/GDP Ratio	The Commercial Banks' Claims on the Private Sector/GDP Ratio
1971	8.2	7.7
1972	8.9	6.3
1973	9.2	5.9
1974	5.3	4.5
1975	6.4	4.8
1976	9.7	6.0
1977	11.6	5.0
1978	16.1	6.5
1979	15.7	10.0
1980	12.9	9.1
1981	13.2	8.3
1982	17.0	9.7
1983	24.1	13.6
1984	31.9	16.1
1985	34.9	18.5
1986	40.0	21.2

Sources: 1.   SAMA, Annual Report, different issues 1975-1986.
           2.   SAMA, Money and Banking Statistics, 1st Quarter 1987,
                Table 6(f) and Table 1(j).

Table 3.13 INCOME VELOCITY OF MONEY (NON-OIL SECTOR), INFLATION RATE
AND THE NON-OIL GDP'S GROWTH RATE

	V_1	V_2	V_3	Inflation rate	Non-oil GDP
1971	3.51	2.86	2.59	4.86	6.0
1972	3.35	2.67	2.91	4.3	7.1
1973	3.12	2.55	2.88	13.9	12.9
1974	2.96	2.54	2.22	21.5	15.1
1975	3.58	3.10	2.65	34.7	13.0
1976	3.31	2.97	2.56	31.5	19.8
1977	2.74	2.54	2.23	11.2	16.9
1978	2.41	2.26	2.02	11.2	14.5
1979	2.25	2.08	1.87	1.9	11.2
1980	2.48	2.21	1.98	3.6	11.8
1981	2.67	2.17	1.92	2.9	12.4
1982	2.65	2.00	1.75	1.12	11.3
1983	2.54	1.87	1.61	6.8	7.0
1984	2.53	1.87	1.59	-1.2	5.0
1985	2.47	1.73	1.42	-3.2	-2.7
1986	2.21	1.56	1.29	-3.0	-6.0

Sources: 1. SAMA, Money and Banking Statistics, 1st Quarter 1987, Table 4(c).
2. SAMA, Annual Report, different issues, 1975-1986.

Notes :

V_1 = income velocity of M_1

V_2 = income velocity of M_2

V_3 = income velocity of M_3

rigidly and intimately linked. A natural corollary is that whenever the Bank of England changes the discount rate, the other rates are changed almost simultaneously, if not by the same amount.

Lending and borrowing in a developed money market is carried out by different financial instruments, such as commercial papers, bills of exchange (more importantly the short and medium-term treasury bills and certificates), short-term government securities and short-period loans by bankers through bankers' acceptance. These instruments can be easily liquidated through the secondary money market, normally a very active market in DCs. By comparison, lending and borrowing in the money market of most less-developed countries is carried out mainly through bankers' acceptance.

3.3 THE SAUDI MONEY MARKET

In the light of the facts and figures given in section 3.1, it seems clear that the Saudi money market has developed remarkably during the last fifteen years. However, it cannot yet be classified as a developed money market.

In this section we will discuss the nature of the Saudi money market, provide brief details of its financial institutions, and throw light on the main obstacles facing it.

The Saudi financial system consists of four major parts:

(1)   There are eleven commercial banks in Saudi Arabia: two are original Saudi (i.e. 100 per cent Saudi-ownership), and the other by Saudis and foreigners together (60 per cent Saudi-owned and 40 per cent foreign-owned). The commercial banks in Saudi Arabia have much the same role as in any other economy, though their

scope is somewhat limited compared with that of banks in the developed countries. Since 1971, the commercial banks in Saudi Arabia have experienced a substantial growth in their balance sheets and a noticeable improvement in their financial services and activities. Moreover, their number of branches has increased significantly from 98 in 1978 to 628 in 1986.

(2) Various specialised credit institutions (six government funded) established by the government to help foster economic development. These are the most important sources of long-term financing in Saudi Arabia.

(3) SAMA (the Saudi Arabia Monetary Agency) is charged with overseeing the banking system, conducting monetary policy and managing the government's foreign assets.

(4) The money changers remain an important part of the financial community. However, SAMA found that their financial activities conflicted with its efforts to gain better control over the money supply and it has therefore begun to restrict and regulate their financial position in an attempt to end their role in the Saudi financial system. Consequently, their relative importance has declined and will continue to diminish further. Therefore as there are no saving or financial investment institutions, except small insurance companies, these companies have no significant impact on the Saudi money market.

As a result of the enormous development in the Saudi banking system and the establishment of government funding institutions, the organized money market in Saudi Arabia has expanded quite extensively with the result that the unorganized money market has almost disappeared.

The interest concept represents the main obstacle facing the

development of the money market and capital market in Saudi Arabia. According to Islamic teaching, interest is strictly prohibited. Moreover, Islamic literature makes no distinction between usury and interest, referring to both as **riba** (forbidden). As a result, SAMA is prohibited from dealing with interest and should not act in a manner which conflicts with the teachings of Islamic law. However, SAMA is involved in interest rates in its international market operations because it deals in foreign bonds and other securities purchased outside Saudi Arabia. In February 1984, SAMA announced a riyal money market instrument called Banker Security Deposit Account (BSDA) offered to domestic banks on a discount basis. Obviously this instrument involves interest. It will be discussed in more detail in the next section. Moreover, the Saudi comercial banks give and receive interest.

The official prohibition of interest in the Saudi economy has led to unfavourable interrelated consequences:

(1)   SAMA has been forced to use only one primary monetary policy tool (minimum required reserve ratios) and secondary monetary policy tools, such as sales of forward dollar, swap and SAMA placements of funds on behalf of Saudi government agencies, with Saudi commercial banks. The other primary monetary policy tools (open-market operations and discount rate) are not available to SAMA simply because they involve interest. In addition SAMA cannot act as the lender of last resort of the commercial banks. These restrictions have greatly hindered SAMA's ability to control the money supply, to regulate the commercial banks' credits and to control the interest rate level.

(2)   The government cannot have public debts, and therefore government securities cannot be purchased/sold through the banking system in order for it to expand.

(3)   Lending and borrowing in Saudi Arabia is carried out mainly through banker acceptance. As there are very few money market instruments, there are no secondary money markets in Saudi Arabia.

(4)   The ability of the Saudi financial sector to absorb the private sector's financial surpluses is very limited, there being very few financial investment opportunities for recycling the surpluses into productive investment within the Saudi economy. Broadly speaking, there are only three alternatives: self-financing projects, equity holding in Saudi companies, and commercial banks and savings deposits. Because of this and other factors, such as (a) the low domestic interest rate compared to foreign interest rates, (b) the regulatory constraints on the banking system such as the high reserve requirement applicable to commercial banks' liabilities, and (c) the legal lending limit which imposes a ceiling on the amount one bank can lend to one entity, much of the excess domestic liquidity has found its way offshore, particularly to Bahraini Offshore Banking Units (OBUs) usually in the form of short-term deposits. Abdeen and Shook (1984) indicated that in September 1979 Saudi riyal transactions acounted for approximately $6 billion of the total of $27 billion of OBU assets. In August 1982 the OBU's assets peaked at $61.6 billion, declining to $6.1 billion in March 1983. Most of these assets were derived from Saudi Arabia and Kuwait. Undoubtedly the BOBUs and other financial market, such as London and New York, have made SAMA's task of controlling the money supply more difficult.

3.4 THE SAUDI FINANCIAL INSTITUTIONS

This section discusses the major parts of the Saudi financial system: (1) the commercial banks; (2) the Saudi Arabia Monetary Agency (SAMA); (3) the specialized credit agencies.

3.4.1 THE COMMERCIAL BANKS:

Tables 3.14 and 3.15 provide summary information regarding the total assets and liabilities of Saudi commercial banks for the period 1970 to 1986. The most striking feature is the remarkable increase in the components of the total assets and liabilities of the commercial banks. As a consequence of the bank Saudization, commercial banks in Saudi Arabia may be grouped into 'indigenous banks' and 'other banks', the latter owned, 60 per cent and 40 per cent respectively, by Saudis and foreigners. Of the indigenous banks, the National Commercial Bank and the Riyal Bank are 100 per cent Saudi-owned. These banks have dominated the Saudi money market. In 1985 their total assets, total deposits and total loans accounted for about 51, 53.5 and 51 per cent respectively of the commercial banks' total assets, total deposits and total loans (see Tables 3.16, 3.17 and 3.18).

Most of the Saudi commercial banks' credits are short term and mainly finance the trade and building and construction sectors. The booming infrastructural activities in Saudi Arabia and the high growth of imports experienced during the 1970s and early 1980s encouraged the commercial banks to extend a disproportionate percentage of their loan facilities to these sectors. Table 3.19 indicates that funding the trade and construction sectors accounted for more than 50 per cent of Saudi commercial banks' total credit throughout the period. The simplicity and the volume of the transactions involved, as well as the short maturity and the high turnover, account for the huge amount of credit to these sectors.

The sharp drop in oil revenue and the corresponding cuts in government expenditure, which led to substantial economic changes after the booming oil price era, started to reflect on the commercial banks' lending. The banks experienced an overall decceleration in commercial lending, coupled with a shift in the demand for credit from the booming sectors of the 1970s, such as trade, real estate, and construction which were all directly or indirectly dependent on government expenditure, to industry, finance, agriculture and personal sectors.

The Saudi commercial banks' sources of revenues are still basic and unsophisticated by Western banking standards, being mostly confined to normal banking fee services, local and offshore syndicated loan fees, and returns on local and foreign investment. This is due largely to religious restrictions on the receipt and payment of interest and to the legal restrictions imposed on the commercial banks. An example of the legal restrictions is that a bank is not allowed to own property other than that required for its specific banking function. Furthermore, the government has ruled that mortgages are illegal and unenforceable. As a consequence, banks are not able to obtain revenue from real estate speculation or mortgages. Also, the lack of the government securities market and secondary financial markets preclude other possible revenue sources.

The main challenges facing Saudi commercial banks can be summarized as follows:

(1)   Changes in the business environment.

(2)   Declining traditional lending opportunities.

(3)   International competition.

(4)   Diversifying revenue sources.

(5)   The need to build a good management structure.

3.4.2 THE SAUDI ARABIAN MONETARY AGENCY (SAMA):

SAMA was established in 1952. In its early years, the restrictions imposed by law made it virtually impossible for SAMA to perform the real functions of a Central bank. The main restrictions were that SAMA could not issue paper currency, could not extend credit to the government or private entities, and could not pay or receive interest. Over the years these restrictions have to a large extent been overcome.

Currently SAMA performs most of the functions traditionally associated with a Central bank. These functions are:

(1) issuing coins and notes; (2) regulating the commercial banks' activities, exchange dealers and money changers; (3) holding the country's foreign reserves; (4) serving as a banker to the government; (5) determining monetary policies; (6) acting as an inter-bank clearing house; (7) controlling the kingdom's foreign assets and investing on behalf of the government in the international financial market.

As previously noted, SAMA can use only one primary monetary policy tool, which is the reserve requirement ratio, and several secondary monetary policy tools to carry out its monetary policies and maintain equilibrium in the Saudi money market. Occasional money market disturbances can, in the absence of open market operations and a discount window, be handled by SAMA, through the secondary monetary tools. These tools are:

(1)   Sale of Forward Dollar:

   This is a straightforward mechanism of selling forward dollars against riyals to banks seeking to cover their position or their customers' position, thus relieving pressure on the Saudi riyal's liquidity.

(2) **Swaps:**

The Saudi riyal's liquidity can be created temporarilly by SAMA undertaking to buy dollars spot and sell them back forward to banks for a specific period of time. The difference between the spot and forward fixed rate represents the cost of Saudi riyal borrowing and effectively sets a ceiling on the SR interest rate in the market.

(3) **Placements of Funds on Behalf of Saudi Government Agencies::**

SAMA can use the simple device of placing riyals with domestic banks on behalf of various government agencies at times of market disruption. Such new liquidity has a psychological as well as the obvious economic benefits.

SAMA did not use the reserve requirement tool until 1959, seven years after its establishment. In late 1979 SAMA also used it in an attempt to encourage the commercial banks to extend more longer-term loans. It reduced the reserve ratio for demand deposits from 15 to 12 per cent and then to 7 per cent in February 1980, along with a similar reduction in the required time deposit reserve ratio. Despite these significant reductions the commercial banks' claims on the private sector showed a decreasing growth rate after 1980 (see Table 3.5). In addition, there have been no essential changes in the short-term credit share of the commercial banks' total credits. It seems, therefore, that to date this tool has not been effective in stimulating the commercial banks to extend long-term credit or even mid-term credit to the private sector.

SAMA took the first step towards creating a fixed-interest securities market when, over the past few years, it introduced a riyal market instrument called Bankers' Security Deposit Account (BSDA) offered to domestic banks on a discount basis. The aim of the BSDA

scheme is to increase SAMA control over the money supply and to provide risk-free domestic assets for the commercial banks. The scheme was started with 91-day non-negotiable and non-transferable BSDAs. The banks eventually succeeded in securing better interest rate for BSDAs and the right to trade them. SAMA later introduced 180-day and 30-day BSDAs in April 1985 and September 1985 respectively. SAMA offers these BSDAs on a weekly basis in an aggregate amount of SR 900 million for one month, and SR 500 million for three months and six months each. During 1986 SAMA began offering repurchase facilities against collateral of its BSDAs. Moreover, the rates on these instruments have been slightly improved.

There are three broad monetary policy objectives in Saudi Arabia:

(1) Regulating the money supply and maintaining the external value of the riyal to achieve monetary stability. The monetary authority considers this to be both a short and long-term objective.

(2) Saudi Arabia, like other developing countries, aims not only to maintain monetary stability, but also encourages the growth of an adequate and efficient banking system.

(3) In supporting and promoting the economic growth, these latter objectives are considered long-term objectives.

3.4.3 THE SPECIALISED CREDIT INSTITUTIONS:

In Saudi Arabia there are six specialised credit institutions. These are detailed as follows:

(1) **The Public Investment Fund (PIF)** meets the medium and long-term financing requirements of large industrial and commercial projects of public sector enterprise through loans and equity participation in such projects.

Table 3.14 CONSOLIDATED BALANCE SHEET OF SAUDI COMMERCIAL BANKS' ASSETS
(In SR million)

	Cash in Hand and with SAMA	Foreign Assets	Claim on Private Sector	Unclassified Assets	Inter Bank Assets Omitted	Total Assets
1970	321	535	1664	406	41	2967
1971	533	705	1759	343	39	3379
1972	580	1366	1780	239	116	4081
1973	1319	1902	2398	237	142	5998
1974	1959	2237	4514	281	448	9439
1975	4845	3617	6722	528	606	16318
1976	7111	8289	9884	2546	2530	30360
1977	15244	9687	10118	6876	2507	44432
1978	19334	13581	14484	9482	2572	59563
1979	14622	17080	25861	4568	1303	63434
1980	10483	25241	34919	3275	2284	76202
1981	9703	48474	43148	5051	1567	107943
1982	11760	55689	50535	7991	3401	129376
1983	9418	56432	56201	7084	2367	131502
1984	10757	67602	59315	8638	4595	150907
1985	11311	69228	60423	9288	6379	156629
1986	11965	78096	60247	10727	4592	165627

Source: 1. SAMA, Money and Banking Statistics, 1st Quarter 1986, Table 6(a).
2. SAMA, Annual Reports, different issues, 1975-1986.

3.15 CONSOLIDATED BALANCE SHEET OF SAUDI COMMERCIAL BANKS: LIABILITIES
(In SR million)

	Total Deposits	Foreign Liabilities	Capital and Reserve	Unclassified Liabilities	Total Liabilities
1970	1736	181	178	834	2929
1971	2116	257	194	773	3339
1972	2863	292	205	605	3965
1973	4077	419	243	1117	5856
1974	6340	873	348	1429	8991
1975	11302	1786	679	1945	15712
1976	19365	4669	942	2855	27831
1977	28704	5325	1192	6705	41926
1978	37330	7075	1851	10624	56880
1979	43964	6998	2521	8699	62182
1980	54641	5018	4129	10130	73918
1981	74745	11725	5562	14344	106376
1982	95420	4932	7226	18398	125976
1983	98550	3217	9218	18150	129135
1984	110286	9247	11220	15559	146312
1985	110568	9794	12777	17111	150250
1986	115254	12787	13156	19838	161035

Sources: 1. SAMA, Money and Banking Statistics, 1st Quarter 1986, Table 6(a).
2, SAMA, Annual Report, different issues, 1975-1986.

Table 3.16 THE SAUDI COMMERCIAL BANKS: TOTAL ASSETS
(In SR Billion)

	1978	1979	1980	1981	1982	1983	1984	1985	1986
National Commercial Bank	n.a	26.3	31	41.6	51.1	51.1	57.6	55.5	63.7
Riyal Bank	n.a.	19	22.0	24.2	26.6	27.6	32.3	30.5	30
Saudi American Bank	10.3	14.3	14.7	24.7	26.6	n.a	13.8	14.2	15.0
Saudi French Bank	2.2	3.3	5.7	6.3	8.7	11.0	13.0	14.5	15.5
Saudi Dutch Bank	2.1	2.8	3.6	5.5	7.0	8.5	9.0	9.8	n.a.
Saudi British Bank	2.0	2.9	4.3	5.1	6.2	6.8	7.2	8.0	n.a.
Arab Nation Bank	3.0	3.7	3.3	4.1	6.2	7.5	9.1	10.4	n.a.
Bank Al-Jazira	1.5	1.8	2.3	3.2	4.4	4.7	5.2	5.6	n.a.
Saudi Cairo Bank	2.0	2.9	5.6	8.3	9.0	7.2	7.3	8.0	n.a.
Al-Bank Al-Tejari Al Muttahed	n.a.	n.a.	n.a.	2.0	2.5	2.5	2.5	3.0	n.a.
The Saudi Investment Bank	n.a.	n.a.	n.a.	1.0	1.0	1.1	1.2	1.5	n.a.

Note:

n.a. = not available.

Source: Compiled from Bank Annual Reports.

Table 3.17 **THE SAUDI COMMERCIAL BANKS: TOTAL DEPOSITS**
(In SR Billion)

	1978	1979	1980	1981	1982	1983	1984	1985	1986
National Commercial Bank	19.2	24.3	27.0	32.7	45.4	46.5	47.8	50.0	53.5
Riyal Bank	6.5	8.5	11.0	17.9	19.1	20.0	26.2	25.3	27.2
Saudi American Bank	n.a.	n.a.	6.3	6.4	9.5	10.5	11.6	11.6	n.a.
Saudi French Bank	1.7	2.2	4.6	5.1	7.9	9.8	10.6	11.5	n.a.
Saudi Dutch Bank	1.9	2.4	3.0	4.6	5.8	6.0	6.5	7.0	n.a.
Saudi British Bank	1.5	2.3	3.8	4.4	5.1	5.8	6.1	8.5	n.a.
Arab Nation Bank	n.a.	3.2	2.9	3.6	5.2	6.3	7.5	8.7	n.a.
Bank Al-Jazira	1.3	1.7	2.0	3.0	4.0	4.35	4.7	5.0	n.a.
Saudi Cairo Bank	2.0	2.4	4.2	5.7	5.5	5.6	5.8	6.0	n.a.
Al-Bank Al-Tejari Al Mattahed	n.a.	n.a.	n.a.	n.a.	n.a.	2.0	2.1	2.9	n.a.
Saudi Investment Bank	n.a.	n.a.	n.a.	n.a.	n.a.	4.0	4.3	4.2	n.a.

Note:

n.a. = not available

Source: Compiled from Bank Annual Reports.

Table 3.18   **THE SAUDI COMMERCIAL BANKS: LOANS**
(In SR million)

	1978	1979	1980	1981	1982	1983	1984	1985
National Comercial Bank	6677	8708	12245	16144	19783	19970	20030	28969
Riyal Bank	2412	3700	5418	8389	10818	10980	11189	11406
Saudi American Bank	n.a.	4000	4303	4042	5178	3600	2537	7168
Saudi French Bank	1215	1587	3897	5363	4790	5484	6212	6842
Saudi French Bank	970	1427	1929	2149	2868	3413	4046	4000
Saudi British Bank	624	1273	1762	2177	2514	3674	5385	1138
Arab National Bank	n.a.	n.a.	1455	1750	2042	2300	2729	2602
Bank Al-Jazira	388	872	1107	1284	1700	1700	1898	1924
Saudi Cairo Bank	n.a.	1158	2850	3058	3500	3748	4036	4336
Al-Bank Al-Tejari Al-Muttahed	n.a.	n.a.	n.a.	n.a.	n.a.	5000	5933	1628
The Saudi Investment Bank	n.a.	n.a.	n.a.	n.a.	n.a.	1200	1325	1181

Note:

n.a.   = not available.

Source: Compiled from Bank Annual Reports.

Table 3.19   DISTRIBUTION OF BANK LOANS AND ADVANCES BY ECONOMIC SECTORS
(In SR million)

	1980 Amount	% Share	1981 Amount	% Share	1982 Amount	% Share	1983 Amount	% Share	1984 Amount	% Share	1985 Amount	% Share	1986 Amount	% Share
1. Agriculture and Fisheries	169	0.6	232	0.	408	0.9	495	1.0	391	1.6	1073	1.7	1156	
2. Manufacturing and Processing	2408	8.9	3460	9.1	4587	9.9	4503	9.0	5667	9.8	6099	9.9	6005	
3. Mining and Quarrying	580	2.1	637	1.7	256	0.6	216	0.9	163	0.3	437	0.7	663	
4. Electricity, water & other utilities	936	3.4	1020	2.7	1126	2.4	1272	2.5	1067	1.9	1011	1.6	1104	
5. Building and Construction	5902	21.7	7513	19.7	9902	21.5	11096	22.2	12924	22.9	13217	21.4	13014	
6. Commerce	9405	36.4	14719	38.6	16518	35.8	17604	35.1	14016	33.0	19072	31.0	21326	
7. Transport and Communications	491	1.8	1080	2.8	1472	3.2	3111	6.2	3563	6.2	4170	6.8	3536	
8. Finance	484	1.8	939	2.5	862	1.9	1088	2.2	1386	2.4	1779	2.9	2415	
9. Services	864	3.2	1560	4.1	1748	3.8	1442	2.9	1936	3.4	2703	4.4	3330	
10. Miscellaneous	5956	20.1	6924	18.2	9226	20.	9250	18.5	10965	19.0	12079	19.6	10730	
Total	27195		38084		46105		50077		57618		61640		63279	

Sources: 1. SAMA, Money and Banking Statistics, 3rd Quarter 1980/1987 Table 20(d).
          2. SAMA, Annual Report, different issues, 1982-1987

(2) **The Saudi Industrial Development Fund (SDF):** provides medium and long-term loans for the establishment and expansion of industrial projects in the private sector and also finances electricalutility projects.

(3) **The Real Estate Development Fund (REDF):** provides financing for housing construction by individuals as well as by private house-building companies.

(4) **The Saudi Agricultural Bank (SAB):** extends medium and long-term loans to farmers.

(5) **The Credit Saudi Bank:** grants loans to low-income Saudi nationals for specified socio-economic purposes.

(6) **Specialist Finance Programmes.**

The main aim of these institutions is to grant interest-free, medium and long-term finance to those sectors of the economy in order to promote economic development. Their credits are to a large extent complementary to the commercial banks' credits (mainly short-term).

Tables 3.1, 3.3 and 3.5 show that the total assets, total capital and reserves, and total loans increased remarkably from SR 17.6 billion, SR 15.4 billion and SR 5.7 billion respectively in 1976 to SR 189.9 billion, SR 184.7 billion and SR 10.9 billion respectively in 1986, registering an annual growth rate of 154.5 per cent, 38.9 per cent and 33 per cent respectively. This reflects the significant role of these institutions in the Kingdom's economic development.

3.5 THE OFF-SHORE RIYAL MARKET IN BAHRAIN

In September 1975 the Bahrain Monetary Agency announced plans to develop a centre in the Arab world for dealing in international

liquidity. It offered an attractive package to prospective participants which included the following:

Firstly, OBUs (Off-shore Banking Units in Bahrain) are exempted from maintaining reserves with the Monetary Agency and from observing liquidity ratios. No withholding tax is to be applied to interest earned by their depositors. No tax is to be paid on their income.

Secondly, absence of restrictions on private enterprise, freedom from exchanges, trade controls, and adequate availability of infra-structure facilities, including first-class communications, all these being important factors in the promotion of Bahrain as an international financial centre.

Thirdly, banks and customers took confidence from the conditions imposed by the monetary agency to safeguard the country against possible bank abuses, namely:

(a)   Every OBU should be a branch of an overseas parent bank;

(b)   Each must be fully staffed and operational and not merely a 'brass plate' booking office for business written elsewhere;

(c)   Each could not deal in any way with the residents of Bahrain, with the exception of the government, its agencies and fully licensed banks. However with the specific approval of the Agency, each might participate in development projects.

Table 3.21 shows, as at the end of each year since 1980, the geographical distribution of the OBUs, based on the countries of incorporation of the parent institutions. It also indicates that the number of OBUs has increased steadily. OBUs include commercial banks, representative offices and investment banks. Several Saudi commercial banks, such as the National Commercial Bank, Riyhd Bank, have either branches or representative offices. The OBUs perform almost all the

financial activities which are normally carried out by other off-shore financial institutions elsewhere, such as currency swap, trade finance, providing loans, contract bonding, bond sales, accepting current and time deposits in major ODCE currencies as well as in Gulf States currencies. Table 3.22 shows that the total assets of OBUs increased noticeably between 1980 and 1984. This reflects the important role of OBUs in the financial system of the Arab Gulf States.

The noticeable increase in Saudi economic activities during the 1970s and early 1980s, a relatively stable Riyal-US Dollar exchange rate, a less sophisticated Saudi banking system in terms of scope of service provided, freedom of movement of capital whether denominated in Riyal or otherwise between Saudi Arabia and abroad, all led to the creation and rapid growth of an off-shore short-run Saudi Riyal market in Bahrain. It is widely believed that Saudi Arabia is a major customer of OBUs and that it commands the lion's share of regional currency deposits in these financial institutions. Table 3.23 shows that the level of regional currency deposits increased between 1978 and 1983 (see Table 3.24). Moreover, it is estimated that in 1982 and 1983 about 70 per cent of regional currency deposits held by OBUs were in Saudi Riyal (see Al-jasser 1986). The Bahrain Off-shore Units market has not only been a major lending and syndication centre for Saudis (and other Gulf) investors, but also an important outlet for such investors looking for internationally comparable returns in international financial markets.

Although SAMA uses and relies on OBUs' financial services and recognises their positive role in the development of the Saudi economy, SAMA is against the OBUs' attempts to speculate in the Riyal. Accordingly, SAMA has taken steps to prevent Bahraini OBUs from speculating in Riyal on the interbank market. Thus, it is not surprising that in March 1980 SAMA shocked OBU currency speculators in

Bahrain, who were up to $30 million short on Riyals by an upward revaluation of the Riyal. SAMA's 1980 revaluation, together with the introduction of the $50 million limit on the Riyals which Saudi banks can exchange on any business day, are only two examples of the actions taken by SAMA against attempts to internationalise the Riyal and to dissuade speculation by Saudi banks.

The role of the off-shore Saudi Riyal market in Bahrain has declined and it is expected to decline further in future. This is mainly because:

(1)   Since 1982, economic activities in Saudi Arabia have experienced noticeable declines. This could well be attributed to the decreases in government expenditure and the correspondingly low growth in income.

(2)   The Saudi banking system has experienced substantial development. Saudi banks have been steadily upgrading their treasury operations with fully automated back-office support, an integrated branch network, and expanded dealing staff. Moreover, since the early 1970s the number of commercial banks and their branches has increased noticeably. The increased competitiveness of banks in the Kingdom, either in the quality of the banking services or in the pricing of these services, is the strongest weapon the Saudi banks possess to recapture their natural business. Tables 3.23, 3.24 and 3.25 show that since 1983 the assets, liabilities and deposits of OBUs have declined steadily.

(3)   Recently, new financial instruments (Bankers Security Deposit Account and Treasury Bonds) have been introduced. These measures could easily squeeze the excess liquidity of the Saudi commercial banks, This in turn would result in the off-shore Riyal market shrinking considerably.

Table 3.20 CREDIT DISBURSEMENT BY GOVERNMENT LENDING INSTITUTIONS
MSR

Year	ADB	SFP	SCB	PIF	SIDF	REDF
Established	1962		1974	1971	1974	1974
1974	36	-	9	263	-	-
1975	146	-	40	603	35	-
1976	269	118	82	1512	1690	2159
1977	490	33	158	3843	2275	8901
1978	586	22	103	6267	5152	7534
1979	709	21	57	3893	6846	5768
1980	946	-	40	2949	6490	8589
1981	1701	-	373	6032	6661	7588
1982	2433	-	331	8772	5347	7142
1983	3341	-	243	9452	5116	8318
1984	3347	-	234	5897	5225	8910
1985	2538	-	025	3662	2415	8581

Key to Abbreviations:

ADB = Agricultural Development Bank
SFP = Special Finance Programs
SCB = The Saudi Credit Bank
PIF = Public Investment Fund
SIDF = Saudi Industrial Fund
REDF = The Real Estate Development Fund

Source: Third Development Plan, p.274; SAMA, Biannual Statistical Survey, 1985.

Table 3.21   NUMBER OF OBUs OPERATING IN BAHRAIN

Incorporated in:	1980	1981	1982	1983	1984	1985	1986
Arab Countries	12	16	20	21	23	23	22
Bahrain	9	12	16	17	17	17	16
Others	3	4	4	4	6	6	6
Western Countries	21	22	23	23	23	23	20
U.K.	9	9	9	9	9	9	9
France	7	7	8	8	8	8	7
Others	5	6	6	6	6	6	4
North America	10	10	11	12	11	10	8
U.S.A.	8	8	9	10	9	8	8
Canada	2	2	2	2	2	2	-
Other Countries	15	17	18	19	19	18	18
S.E. Asia & Pacific	7	7	7	8	8	8	8
Others	8	10	11	11	11	10	10
TOTAL	58	65	72	75	76	74	68

Note:
    OBU's = Offshore Banking Units

Source:
    Economic Research Directorate, Bahrain Monetary Agency.

Table 3.22   ASSETS AND LIABILITIES OF OBUs

(Million U.S. Dollars)

Items	As on December 31						
	1980	1981	1982	1983	1984	1985	1986
ASSETS:							
Loans to non-banks	8493	11242	14316	15977	18392	15873	13862
Interbank funds	26797	35140	39558	41432	41634	38476	39056
Commercial banks in Bahrain	204	144	270	384	310	270	232
Other OBU's	6707	8771	9847	8996	8521	7387	6379
Outside Bahrain	19886	26225	29441	32052	32803	30819	32445
Other assets	2176	4352	5133	5322	2666	2456	2762
Assets = Liabilities	37466	50734	59007	62741	62692	56805	55680
LIABILITIES:							
Deposits from non-banks	8530	11968	13698	14734	14872	13097	13072
Interbank fund	27044	35544	40995	43313	43018	38752	37641
- Commercial banks in Bahrain	410	847	885	1881	1161	1479	1581
- Other OBU's	6707	8771	9847	8996	8521	7387	6379
- Outside Bahrain	19927	25926	30263	32436	33336	29886	29681
Other Liabilities	1892	3222	4314	4694	4802	4956	4967

Note:
OBU's - Offshore Banking Units

Source:
Economic Research Directorate, Bahrain Monetary Agency.

Table 3.23   CURRENCY COMPOSITION OF ASSETS AND LIABILITIES OF OBUs

(Million U.S. Dollar)

As on December 31

Currency	1979	1980	1981	1982	1983	1984	1985	1986	1987
ASSETS:									
U.S. Dollar	18216	24826	34318	42641	47003	48316	43045	42343	49948
Regional Currencies	7440	8283	10568	10799	10791	9933	9128	8037	7603
Deutsche Mark	524	795	1579	1136	1129	1105	1048	1678	2065
Swiss Franc	637	1414	1635	1988	1509	1363	1455	1414	1129
Other	947	2128	2634	2443	2309	1975	2129	2208	2737
Assets = Liabilities		37466	50734	59007	62741	62692	56805	56805	2737
LIABILITIES:									
U.S. Dollar	17539	23631	32958	40813	42872	44722	38895	38468	46460
Regional Currencies	8113	9366	12437	13301	15003	13657	13406	12005	11250
Deutsche Mark	609	786	1483	1079	1121	1035	926	1477	1819
Swiss Franc	546	1101	1416	1543	1411	1347	1670	1456	1396
Others	958	2582	2440	2271	2334	1931	1908	2274	2552

Source: Economic Research Directorate, Bahrain Monetary Agency.

CONCLUSION

Sharp increases in oil revenue and the corresponding expansion in the Saudi government expenditure during the 1970s and early 1980s have had a considerable effect on the monetary and banking sectors in Saudi Arabia. Since 1971 these sectors have experienced significant development. All major financial and monetary indicators in Saudi Arabia, such as monetary aggregates, the total assets/liabilities of Saudi financial institutions, the total deposits of commercial banks, the total foreign assets of SAMA, the total capital and reserves of the commercial banks and specialized credit, and the total credits of the commercial banks and specialized credit institutions, have experienced high growth rates. However, these sectors can not yet be classified as developed sectors. This is because the Saudi financial markets outside the commercial banks are highly rudimentary and the banking and finance structure in Saudi Arabia is very simple.

Our discussion shows that the Saudi Riyal's market is dominated by four players:

(1) There are eleven commercial banks in Saudi Arabia: two are original Saudi (i.e. 100 per cent Saudi-ownership), and the others are owned jointly by Saudis and foreigners (60 per cent Saudi-owned and 40 per cent foreign-owned). The commercial banks in Saudi Arabia have much the same role as in any other economy, though their scope is somewhat limited compared with that of banks in the developed countries. Banking in Saudi Arabia is currently undergoing a drastic change, which will have a profound impact on the economy and its development. The two major elements of this change are:

(a) the dramatic increase in the number of branches, and

(b)   the modernization of the banking techniques used and the services available.

(2)   SAMA (the Saudi Arabian Monetary Agency) performs most of the functions traditionally associated with a central bank. These functions are:

(a)   issuing coins and notes;

(b)   regulating the commercial banks' activities, exchange deals and money changers;

(c)   holding the country's foreign reserves;

(d)   serving as a banker to the government;

(e)   determining monetary policies;

(f)   acting as an inter-bank clearing house;

(g)   controlling the Kingdom's foreign assets and investing on behalf of the government in the international arena.

The lack of discount operations, certificates of deposit and other debt instruments have somewhat limited SAMA's ability to effectively manage domestic liquidity. However, the introduction in 1984 of 91-day Banking Security Deposit Accounts (BSDA) was a step in the right direction towards controlling the money supply, the Riyal interest rate and price levels.

(3)   Various specialized credit institutions (six government-funded) established by the government to help foster economic development. These are the most important sources of long-term financing in Saudi Arabia.

(4)   The money changers remain an important part of the financial community. However, SAMA found that their financial activities conflicted with its efforts to gain better control over the money supply, and it has therefore begun to restrict and regulate their financial activities in an attempt to end their role in the Saudi

financial system. Consequently the money changers' relative importance has declined and it will, no doubt, continue to diminish further.

APPENDIX   A

CHARTER   OF   THE   SAUDI   ARABIAN   MONETARY   AGENCY   (SAMA)

Royal   Decree   No.   23

23 Jumad Awal 1377

(15 December 1957)

With the help of God Almighty

We, Saud Ibn Abdul Aziz Al-Saud,

King of Saudi Arabia,

having seen Decree No. 304/4/1/1047 issued on 25 Rajab,Decree No. 17/19/2/8792 issued on 17 Ramadan 1374, and Council of Ministers' Resolution No. 103 dated 20 Jumad Awal 1377, and in view of what our Minister of Finance has submitted to us, we ordain the following:

Article 1

The objective of the Saudi Arabian Monetary Agency shall be:

(a)   to issue and strengthen the Saudi currency and to stabilize its internal and external value;

(b)   to deal with the banking affairs of the Government;

(c)   to regulate commercial banks and exchange dealers.

Article 2

The Saudi Arabian Monetary Agency shall not pay nor receive interest but shall only charge certain fees on services rendered to the public and to the Government, in order to cover the Agency's expenditures. Such fees shall be charged in accordance with a regulation passed by the Board of Directors and approved by the Minister of Finance.

The Agency shall not have a capital and shall, therefore, repay to the Government its entire capital.

Article 3

The functions of the Saudi Arabaian Monetary Agency in relation to circulation of currency and regulation of commercial banks, shall be:

(a) To stabilize and strengthen the internal and external value of the currency and take measures capable of strengthening the currency's cover. (For that end the Agency may buy and sell gold and foreign exchange in the market, whenever it deems it necessary and within the limits and conditions approved by the Minister of Finance and National Economy. *Such transactions should be conducted with the utmost secretary.* *

(b) To hold and operate monetary reserve funds as separate funds earmarked for monetary purposes only.

(c) To mint and issue the Saudi coins and handle all matters relating thereto, in conformity with Saudi Currency Law No.24, dated 23 Jamad Awal 1377.

* Addition made to Article 3(a) under Royal Decree No. 10 issued on 1..7.1379.

(d)   To regulate commercial banks and exchange deals as may be appropriate.

Each commercial bank operating in Saudi Arabia shall render to the Monetary Agency a monthly statement of its financial situation in acordance with the specimen forms prepared by the Agency for this purpose. Each bank shall also make available to the Monetary Agency any information required to clarify or integrate the above mentioned statements.

Meanwhile, such bank statements as may be found necessary by the Agency shall not disclose the private accounts of the bank clients.

(e)   The commercial banks shall be asked to keep with the Monetary Agency permanent funds in certain proortion with what deposits the bank is holding. Such proportions shall, from time to time, be fixed to suit the prevailing circumstances, in accordance with a resolution passed by the Minister of Finance and moved by the Agency. Each bank shall strictly adhere to the instructions issued by the Agency in this respect.

Article 4

To deal with the banking affairs of the Government in receiving all revenues and in paying out fund(s), for purposes duly approved by the Government through the Minister of Finance.

Article 5

The Agency shall establish a Research Department to collect and analyse data needed to aid the Government and the Agency in formulating and carrying out financial and economic policies.

Article 6

The Agency shall not undertake any of the following functions:

(a)   Acting in any manner which conflicts with the teachings of the Islamic Law.   The Agency shall not charge any interest on its receipts and payments.

(b)   Receiving private deposits.

(c)   Making advances to the Government or to private parties.

(d)   Engaging in trade or having an interest in any commercial, industrial, or agricultural enterprise.

(e)   Buying or holding fixed property except what the Agency reasonably needs for its operations.

Article 7

The Agency shall be under the control of a Board of Directors which shall be generally responsible for its efficient administration and operation and shall have such powers as are necessary and appropriate to that end.   The Board of Directors may make such rules and regulations as it may consider necessary; the Board of Directors shall recommend them to the Government through the Minister of Finance.

Article 8

The Agency, in the name 'Saudi Arabian Monetary Agency', shall be a corporation with continuing succession.   The Agency is authorized to take such action as may be necessary and appropriate to give effect to this charter, including, but without thereby limiting its authority, authority to make contracts, to acquire and hold and pledge assets, and to incur such liabilities as are necessary and appropriate to the conduct of its operations.

Article 9

The Saudi Arabian Monetary Agency's Board of Directors shall consist of:

(a)   A President, who shall also be the Governor.

(b)   Deputy Governor.

(c)   Three members, non-government officials, who shall be conversant with financial and commercial affairs.

The Governor and members of the Board shall be appointed for 5 years by a Royal Degree, in accordance with the nomination of the Minister of Finance and the approval of the Council of Ministers. They shall not be removed from office except by a Royal Decree which shall be issued the same way. The Board of Directors shall meet at the call of the President, or Vice-President in the absence of the former. Meetings shall be held at least once a month. In the event of the absence of the Governor, the Deputy Governor shall preside over the Board.

The resolutions of the Board shall be passed by a minimum majority of three votes, and in the case of an equal division of votes, the President shall have a casting vote.

Resolutions of the Board shall be transmitted to the Minister of Finance [and] immediately they shall be issued.

Article 10

The Governor shall be responsible for the efficient operation of the Agency and shall represent it before courts. The Deputy Governor shall be appointed by a Royal Decree on the nomination of the Minister of Finance and the approval of the Council of Ministers, in order to act

for the Governor in the event of the latter's absence, whose powers shall then be vested in the Deputy Governor who shall also be removed from office by a Royal Decree. The remunerations of the Governor, Deputy Governor, and Members of the Board shall be fixed by a REsolution of the Council of Ministers in accordance with the recommendations of the Minister of Finance. The appointment of the remaining staff of the Agency, other than the Governor and the Deputy Governor, their promotion and dismissal, shall be dealth with by the Governor under the provisions of a regulation approved by the Board of Directors and Generally based on similar rules and regulations pertaiing to to Saudi and foreign government employees. The Governor shall also fix the salaries of these employees, their wages, the duraction and terms of their services, their duties and responsibilities in conformity with the said regulation.

Article 11

The Agency shall render to the Government, through the Minister of Finance, a copy of the half-monthly and annual statements published in the official bulletin, as provided by Article 11 of Royal Decree No. 24 dated 23 Jumad Awal 1377, in regard to the Saudi Arabian currency.

Article 12

Any bank or exchange dealer who fails to furnish the Agency with the information specified in para.(d), Article 3, or fails to keep with the Agency the deposit mentioned in para.(e) of the same article in the proportion suggested by the Minister of Finance, shall sustain a maximum punishment of SR 10 000. In the event of recidivation to such acts, the Government, in addition to the above mentioned punishment, shall temporarily cease the operations of the bank and close it down.

Article 13

This Statute shall replace the previous Statute of the Agency together with the entire amendments inserted therein and shall cancel each provision not conforming with its articles.

Article 14

The Prime Minister and the Minister of Finance shall put this Statute into effect.

APPENDIX B

THE BANKING CONTROL LAW

Promulgated by Royal Decree No.M/5 of 22/2/1386 AH

Article 1

In this Law the following expressions shall have the definitions specified in this article.

(a)   'Bank' means any natural or juristic person practising basically any of the banking business in the Kingdom.

(b)   'Banking business' means the business of receiving money on current or fixed deposit account, opening of current accounts, opening of letters of credit, issuance of leters of guarantee, payment and collection of cheques, orders, or payment orders and similar other papers of value, discounting of bills, promissory notes and other commercial papers, foreign exchange business and other banking business.

(c)   'National Bank' means a bank. the head office and branches of which are situated in the Kingdom.

(d)   'Foreign Bank' means a bank within the Kingdom and its head office outside it.

(e)   'Agency' means the Saudi Arabian Monetary Agency.

(f)   'Invested capital' means the capital assigned by a foreign bank for the use of its branches in the Kingdom.

Article 2

No person, natural or juristic, unlicensed in accordance with the provisions of thsi Law, shall carry on basically any of the banking business. However:

(a) Juristic persons licensed in accordance with another law or special decree to carry on banking business within the limits of this objects may practise such banking business.

(b) Licensed money-changers may practise basically exchange of currency in the form of notes and coins, but no other banking business.

Article 3

All applications for the grant of licences to carry on banking business in the Kingdom shall be addressed to the Agency which will study the applications after obtaining all the necessary information and submit its recommendations to the Minister of Finance and National Economy.

The licence for a National Bank shall stipulate the following:

(1) It shall be a Saudi Joint Stock Company.

(2) The paid-up capital shall not be less than Rls. 2.5 million and all subscription towards share capital shall be payable in cash.

(3) The promoters and directors shall be persons of good reputation.

(4) The memorandum and articles of assocation shall be acceptable to the Minister of Finance and National Economy.

In the case of a Foreign Bank wishing to set up a branch or branches in the Kingdom, the grant of a licence shall be subject to such

conditions as the Council of Ministers may stipulate upon the suggestion of the Minister of Finance and National Economy. The licence shall in all cases be issued by the Minister of Finance and National Economy after the approval of the Council of Ministers.

Article 4

As an exception to the provisions of the previous Article, the licences or authorizations previously issued to the persons carrying on banking business in the Kingdom and effective at the time of promulgation of this Law, shall continue to be recognized.

The Agency may, however, call for such documents and information from persons as it may deem necessary. The Agency with the approval of the Council of Ministers may call upon them to comply with all or any of the provisions of Article 3 of this Law within such periods as it may fix.

Article 5

Any person not authorized basically to carry on banking business in the Kingdom is not allowed to use the work 'Bank' or its synonyms, or any similar expression in any language, on his papers or printed matter, or in his commercial address or his name or in his advertisements.

Article 6

The deposit liabilities of a Bank shall not exceed fifteen times its reserves and paid-up or invested capital. If the deposit liabilities exceed this limit, the Bank must, within one month of the date of submission of the statement referred to in para. 1 of Article 15, either increase its capital and reserves to the prescribed limit or deposit fifty percent of the excess with the Agency.

Article 7

Every Bank shall maintain with the Agency at all times a statutory deposit of a sum not less than fifteen percent of its deposit liabilities. The Agency may, if it deems it to be in the public interest, vary the aforesaid percentage provided that it shall not be reduced below 10 percent not increased to more than 17.5 percent. The Agency may, however, vary these two limits with the approval of the Minister of Finance and National Economy.

In addition to the statutory deposit provided for in the previous paragraph, every bank shall maintain a liquid reserve of not less than 15 percent of its deposit liabilities. Such reserve shall be in cash, gold, or assets which can be converted into cash within a period not exceeding 30 days. The Agency may, if deemed necessary, increase the aforesaid percentage up to twenty percent.

Article 8

No bank shall grant a loan or extend a credit facility or give a guarantee or incur any other financial liability with respect to any natural or juristic person for amounts aggregating more than 25 percent of the Bank's reserves and paid-up or invested capital. The Agency may, in the public interest and subject to such conditions as it may impose, increase this percentage up to 50 percent.

Article 9

No bank shall undertake the following transactions:

(1) Granting a loan or extending credit facilities or issuing a guarantee or incurring any other financial liability on the security of its own shares.

(2)   Granting without security a loan or credit facilities, or issuing a guarantee, or incurring any other financial liability in respect of:

   (a)   Members of its Board of Directors or its Auditors.

   (b)   Establishments not taking the form of join-stock companies in which any of its Directors or Auditors is a partner or is a manager or has a direct financial interest.

   (c)   Persons or establishments not taking the form of joint-stock companies in cases where any of the Bank's Directors or Auditors is a guarantor.

(3)   Granting without security a loan or a credit facility or giving a guarantee or incurring any other financial liability in favor of any of its officials or employees for amounts exceeding four months salary of any such concerned person.

   Any bank director or auditor or manager who contravenes paras. 2 and 3 of this Article shall be considered as having resigned his position.

Article 10

No Bank shall undertake any of the following activities:

(1)   Engage, whether for its own account or on a commission basis, in the wholesale or retail trade including the import or export trade.

(2)   Have any direct interest, whether as stock-holder, partner, owner, or otherwise, in any commercial, industrial, agricultural, or other undertaking exceeding the limits referred to in Para. 4 of this Article, except when such interest results from the satisfaction of debts due to the bank, provided also that all such interest shall be disposed of within a period of two years or within any such longer period as may be determined in consultation with the Agency.

(3)   Purchase, without the approval of the Agency, stocks and shares of any bank conducting its business in the Kingdom.

(4)   Own stocks of any other joint-stock company incorporated in the Kingdom, in excess of ten percent of the paid-up capital of such a company, provided also that the nominal value of these shares shall not exceed twenty percent of the Bank's paid-up capital and reserves; the above limits may, when necessary, be increased by the Agency.

(5)   Acquire or lease real estate except in so far as may be necessary for the purpose of conducting its banking business, housing of its employees or for their recreation, or in satisfaction of debts due to the Bank

In cases where a bank acquires real estate in satisfaction of debts due to it and such real estate is not necessary for the Bank's own banking business or housing of its employees or for their recreation, it shall dispose of it within three yeqars of its acquisition or, in exceptional and justifiable circumstances, within such period or periods as may be approved by the Agency and subject to such conditions as it may deem fit to prescribe.

As an exception to the provisions of para. 5 of this Article, the Bank may, in special and justifiable circumstances and with the approval of the Agency, acquire real estate, the value of which shall not exceed 20 percent of its paid-up capital and reserve.

Article 11

Banks are precluded from undertaking any of the following operations except after the written approval of the Agency and according to the conditions it prescribes. ¹

(a) Altering the composition of their paid-up or invested capital.

(b) Entering into any scheme of amalgamation or participation in the business of another bank or another establishment carrying on banking business.

(c) Acquiring shares in a company established outside the Kingdom.

(d) Ceasing to carry on banking business. In such a case, the Agency must, before agreeing to this cessation, ascertain that the Bank has made necessary arrangements to safeguard the rights of the depositors.

(e) Opening branches or other offices in the Kingdom and also opening of branches or other offices by national banks outside the Kingdom. Before granting this written licence provided for under this paragraph, the Agency shall get the approval of the Minister of Finance and National Economy.

Article 12

No person shall be a director of more than one bank.

No person in the following cases shall be elected as a director or

shall become manager of any bank without prior written approval of the Agency:

(a)   If he occupied a similar position in a banking concern that was wound up, even if the liquidation has been made before the promulgation of this law. Such approval shall not be given by the Agency until it becomes clear that the person concerned was not responsible for that liquidation.

(b)   If he was removed from a similar post in any banking establishment, even if such removal was before the promulgation of this law. The approval of the Agency shall in this case be based on acceptable reasons.

Any director or manager of a bank who is adjudicated bankrupt or convicted of a moral offence shall be considered as having resigned his post.

Article 13

Every bank shall before declaring distribtion of any profits, transfer a sum equal to not less than 25 percent of its net profits, to the statutory reserve, until the amount of that reserve equals as a minimum the paid-up capital.

No Bank shall pay dividends or remit any part of its profits abroad, until its aggregate foundation expenditures and losses incurred have completely been written off, and after deducting not less than 10% of the value of capitalized expenditures until all these expenditures have been completely written off.*

*   Amended in accordance with Royal Decree No. M/2 dated 6-1.1391.

Any action taken to declare or pay dividents in contravention of the provisions of this article shall be considered null and void.

Article 14

Every Bank shall appoint annually two auditors from amongst the approved list of auditors registered with the Ministry of Commerce and Industry. The Auditors shall submit a report on the balance sheet and profit and loss account. This report shall include whether in the auditors' opinion the Bank balance-sheet duly and correctly represents its financial position and the extent of their satisfaction with any explanations or information they may have requested from the Bank manager or other staff.

As regards banks taking the form of a company, the report referred to in the above paragraph shall be read together with the annual report of the Bank management in the General Meeting which must be held within the six months following the end of the Bank's financial year. The Bank management should send copies of these two reports to the Agency.

The provisions of the first para. of this Article shall apply to foreign banks in respect of their branches operating in the Kingdom. They should send a copy of the Auditors' report to the Agency.

Article 15

Every bank shall furnish the Agency by the end of the following month with a consolidated monthly statement of its financial position relating to the previous month which shall be true and correct and be in the form prescribed by the Agency. Every bank shall also furnish the Monetary Agency within six months of the close of its financial year with a copy of its annual balance sheet and profit and loss account certified by its auditors in the form prescribed by the Agency.

Article 16

The Monetary Agency may, with the approval of the Minister of Finance and National Economy, issue general rules regarding the following matters:

(1) The maximum limits of total loans that can be extended by a bank or banks.

(2) The prohibition or limitation of specified categories of loans or other transactions.

(3) Fixing the terms and conditions which banks should take into consideration when carrying out certain types of transactions for their customers.

(4) The cash margins to be obtained by banks against specified categories of credits or guarantees.

(5) The minimum ratio to be observed between the limits for loans and the collateral for such loans.

(6) Fixing the assets to be maintained by each bank within the Kingdom. Such assets should not fall below a certain percentage of the bank's deposit liabilities which shall be fixed by the Agency from time to time.

The Agency may, from time to time, issue decisions concerning the following:

(1) Definition of the expression 'deposit liabilities' referred to in this law.

(2) Determination of bank holidays and business hours in banks.

Article 17

The Agency may, at any time, require any bank to supply it, within a time limit it will specify and in the manner it will prescribe, with any information that it deems necessary for ensuirng the realization of the purposes of this Law.

Article 18

The Agency may, with the approval of the Minister of Finance and National Economy, cause an inspection to be made of the books and accounts of any bank, either by the Agency's own staff or by outside auditors assigned by it. The examination of the bank's books and accounts should take place in the bank's premises. In such a case the Bank staff must produce all the required books of accounts and other documents in their custody or within their authority and must furnish any information they have relating to the bank.

Article 19

Any person who comes into possession of information during the performance of his duties in the implementation of this Law, is not allowed to disclose such information or to make use of it in any manner.

Article 20

The Agency shall periodically publish combined statements of the principal data contained in the returns mentioned in Article 15.

Article 21

The Minister of Finance and National Economy, in exceptional

circumstances, and with the prior approval of the Council of Ministers, may exempt any bank from any provision of this Law or from the regulations issued in execution thereof for a limited period and subject to such other conditions as may be laid down in each case.

Article 22

If the Agency finds that a bank has failed to comply with the provisions of this Law, or with the provisions of any regulations issued under this Law, or if a bank adopts a policy that might seriously affect its solvency or liquidity, it may, with the approval of the Minister of Finance and national economy, take one or more of the following measures:

(a) Appoint one or more advisers to advise the bank in the conduct of its business.

(b) Order the suspension or removal of any director or officer of the bank.

(c) Limit or suspend the granting of credits or the acceptance of deposits.

(d) Require the bank to take such other steps as it may consider necessary.

If the Agency finds that a bank persistently contravenes the provisions of this Law or the decisions or regulations made thereunder, it may call upon such a bank to submit its reasons for the contravention, accompanied by its proposals to rectify the position within a stated period. If the Agency is of the opinion that such proposals are not sufficient for their purpose or if the bank fails to implement an agreed or prescribed course of action within the stated

period, the Minister of Finance and National Economy may, subject to the approval of the Council of Ministers, revoke the licence of the said bank.

Article 23

(1) Any person who contravenes the provisions of para. 1 of Article 2, Article 5 and items a, b and c of para. 1 of Article 11, Article 12 and Article 18, shall be liable to imprisonment for a term not exceeding two years and to a fine not exceeding Rls. 5000 for every day the offence continues or to either of these penalties.

(2) Any person who contravenes the provisions of Article 19, shall be liable to imprisonment for a term not exceeding two years and to a fine not exceeding Rls. 20 000, or to either of these penalties.

(3) Any person who contravenes the provisions of Articles 8, 9 and 10, shall be liable to imprisonment for a term not exceeding six months and to a fine not exceeding Rls. 10 000, or to either of these penalties.

(4) Any person who contravenes the provisions of Articles 7, 14 and 15 shall be liable to a fine not exceeding Rls. 500 for every day the contravention continues.

(5) Any person who contravenes any other provision of this Law or the Regulations and decisions issued in execution therefore shall be liable to a fine not exceeding Rls. 5000.

(6) In the event that offences punishable according to para. 2, 3 and 5 of this Article are committed by the same person for one purpose and provided that such offences are interrelated as to object and timing they are to be considered as one offence punishable by one penalty.

Article 24

The Chairman, the Managing Director, the Directors, Head Office Manager and Branch Manager shall be responsible, each within his own jurisdiction, for any contravention of this Law or the decisions and rules issued for its execution.

Article 25

The Minister of Finance and National Economy shall appoint a committee of three persons from outside the Agency and specify the conditions and measures to be observed in adjudging contraventions punishable under this Law at the request of the Agency.

Article 26

The Vice-President of the Council of Ministers and the Minister of Finance shall put this Law into effect and it shall come into force from the date of its publication.

CHAPTER IV

A LITERATURE REVIEW ON THE DEMAND FOR MONEY IN THE DEVELOPED
AND LESS-DEVELOPED COUNTRIES AND SAUDI ARABIA

INTRODUCTION

In this chapter several selective empirical studies, which explain theoretically and empirically the behaviour of the demand for money in several countries with diverse economic characteristics, were reviewed in the hope that their hypotheses would be helpful in constructing an appropriate empirical model of the demand for money for the Saudi economy. This chapter is organised as follows:

The first section is devoted to reviewing some empirical works on the demand for money in developed countries and to throw light on some important issues associated with the specification of the demand for money in these countries. Demand for money in less developed countries are selectively examined and some factors which are believed to have an important influence on the the behaviour of the demand for money in these countries are briefly highlighted. In section three several recent empirical studies on the demand for money in Saudi Arabia are also reviewed.

4.1 A REVIEW OF THE LITERATURE ON THE DEMAND FOR MONEY IN THE DEVELOPED COUNTRIES

Since the 1960s the demand for money function in developed countries has been subjected to extensive theoretical and empirical research in an attempt to determine the most applicable and stable definition for money and to formalize the relationship between the quantity of money demand and factors that can affect the demand for money in these countries. Consequently, there has been a great deal of literature on the demand for money in developed countries. As we mentioned above, this section presents a review of the literature which surveys some selective studies on the demand for money in the developed countries. It also sheds light on some important and controversial issues associated with the specification of the demand for money in these countries.

A major theoretical development of liquidity-preference in the post-Keynesian era was to examine the effect of the wealth as scale variable on the demand for money. Bronfenbrenner and Mayer (1960) extended a Keynesian liquidity-preference equation to include a wealth variable. They examined the money demand function of the American economy during the period 1919-1956. Their aim is to analyze the aggregate liquidity functions using total money balances and idle balances as alternative dependent variables in an attempt to answer several important questions, such as, is there a definite observable liquidity function, i.e. a relationship between money holdings and interest rate? Secondly, assuming this function to exist, what is its

interest elasticity? Thirdly, assuming this function to exist, what is its stability over time? Fourthly, if shifts over time are found, what are their causes, i.e. what other variables are important? Finally, does the liquidity function appear to impose an observable floor to interest rates?

Bronfenbrenner and Mayor employed the following independent variables in their function. The first independent variable is the 4-6 months commercial paper rate to represent the yield on alternative assets. They indicated that their rate is more sensitive to economic changes than are longer term and it is nearly free of risk and appreciation; the second independent variable is the logarithm of national wealth. For this variable Bronfenbrenner and Mayor used Goldsmith's series on total national wealth in 1929 prices; the third independent variable used is the logarithm of prior year idle balances.

Bronfenbrenner and Mayor employed the following short-run money demand functions as the base for their analysis of the demand for money in the United States:

$$\ln M^i_t = a_1 - a_2 \ln V_t + a_3 \ln W_t + a_4 \ln M^i_{t-1}$$

$$\ln M^i_t = a_1 + a_2 \ln Y_t + a_3 \ln W_t - a_4 \ln V_t + a_5 \ln M^i_{t-1}$$

Where M^i_t and M^i_{t-1} are the current and lagged idle balances respectively, V_t is the current short term interest rate, W_t is current national wealth, and T_t is current GNP.

The empirical results of this study revealed that all variables except the wealth variable are statistically significant with right sign. Bronfenbrenner and Mayor indicated that the negative wealth elasticity in equation No. 3 represent the extreme opposite of Friedman's conclusion. Morover, this finding suggests that the money may be an 'inferior asset' of which people hold less as their wealth increases. They also pointed out that a more plausible explanation of this finding (the negative elasticity for wealth) is that the use of wealth and income simultaneously in the money demand function results in a high degree of multicollinearity, such that little significance should be attached to income and wealth variable. The study also showed that the interest rate plays a relatively small role in the demand function for money. In short, the empirical result of Bronfenbrenner-Mayor's study failed to support any strong conclusions that the wealth has a significant effect on the demand for money.

A prominent empirical study on the demand for money in the United States was carried out by Goldfeld (1973). Quarterly data running from 1952 Q_1 to 1973 Q_4 was employed. Goldfeld attempted to answer some important questions, such as, is there any indication that the income elasticity is difficult to pin down from quarterly data as has been previously suggested? Has the demand function for money remained stable over the postwar period? Is there any evidence that the expected rate of inflation influences the demand for money in the United States? Should income, or wealth, or perhaps both, by used in the demand function for money? Which interest rate works best in explaining the demand for money in the United States? A partial adjustment model of the Koyck type was used in this study. Goldfeld's basic short-run function is:

$$m - B_0 + B_1 Y_t + B_{2rt} + B_3 m_{t-1}$$

where

m is real money stock defined in a narrow and broad sense (M_1/P and M_2/P)

Y is the real income (real GNP)

r is the interest rate measured by the rate on the commercial paper (RCP) and by the rate on time deposits (RTD)

m_{t-1} is the lagged dependent variable

The empirical results obtained from estimating the above basic short-run equation with respect to M_1 indicated that all the explanatory variables are significant with right signs. Moreover,, Goldfeld reached the tentative conclusion that the demand equaltion for M_1 (the above equation) does a satisfactory job of tracking the demand for money in the United States and it seems that it also predicts the demand for money (M_1) satisfactorily. The same equation estimated with respect to M_2 revealed that only RTD had a negligible and insignificant impact on the demand for M_2.

The basic equation was modified to include the expected rate of inflation which was measured by using the adaptive expectation hypothesis. The empirical results obtained from estimating the demand equation for M_1 after including the expected rate of inflation revealed that the expected inflation rate is significant and its inclusion raises the long-run income elasticity from 0.68 to 0.76 and lowers the speed of the adjustment from 2.5 to 3.5. The elasticities for the interest rate of the commercial paper and time deposits remain virtually the same.

Goldfeld modified his basic function again to include the wealth (the net worth into new saving and capital was used as a measure of the wealth in this study) and the change in wealth. Several equations were estimated in order to determine the most appropriate measure (or

measures) of the scale variable. In the first equation only the wealth was included as scale variable. The second equation included both the wealth and the change in wealth. The third equation included the income and the change in wealth. In the fourth equation all the three variables (income, wealth and change in wealth) were included. Goldfeld found that the income and the change in wealth were significant when they appeared in the same equation. He also found that the wealth variable was unimportant when it was used with income alone, while the latter retained its significance when all the three variables were included in the same equation.

An empirical study on the demand for money in the U.K. was carried out by Artis and Lewis (1976). Their main objective was to fit a short-run money demand function to quarterly data runs from 1963 Q_2 to 1973 Q and to test the stability of the money demand function in the U.K.

As dependent variables, three money definitions - narrow, broad and intermediate (M_1, M_3 and M_{3A}) - were used in this study. Intermediate definitions were generated by deducting the certificates of deposit from M_3. These definitions were used in the nominal term (M_1, M_3 and M_{3A}), nominal per capita term (M_1, M_3 and M_{3AN}) and real per capita term (m_{1N}, m_{3N} and m_{3AN}).

The basic form of their short-term function is:

$$M_t = a_0 + a_1 Y_t + a_2(r-r_m) + a_3 Q_t + a_4 M_{t-1} + W_t$$

   where
   Y = income
   r = interest rate
   r_m = own rate on money
   Q = index of the quality of bonds
   M_{t-1} = lagged dependent variable
   W_t = error term

The interest rate was presented in the equations of this study as the consol rate or the differential between the consol rate and the own rate of money. The local authority three-months rate was also used as an alternative to the consol rate in some of the equations. All the equations were in natural logarithmic form.

The major empirical findings obtained from estimating several equations for the three sub-periods can be summarized as follows: For m_1 and m_{1N}, the income was found to be significant with long-run elasticities less than unity (around .516). The interest rates were also significant with right sign (negative) and relatively low long-run elasticities (the highest elasticity was -0.232). Q (the variability of bond prices) was found to be generally significant with the expected (positive) sign and notably low long-run elasticities. For M_3, M_{3N} and M_{3A}, the income was found to be generally significant with considerably low long-run elasticities. R (consol rate) $(r-r_m)$ and Q appeared to perform satisfactorily. In general these variables were found to be significant with very low long-run elasticities.

As far as the stability of the demand equations for money is concerned, the evidence of the Chow Fisher test as applied to the overall equations of this study indicated that the null=hypothesis of no structural change cannot be sustained. However, the application of ex-post predictive test revealed that the estimated equations for the first and also second sub-period forecasted very badly and systematical under predicting.

The demand for money in an open economy, particularly those of Germany and the U.K., was examined by Hamburger (1977). He aimed to test some important theoretical and empirical issues associated with the

specification and estimation of the demand for money in these countries, such as the influence of the openness of the economy on the demand for money; the appropriate measure of the opportunity cost of holding money in these countries; and, finally, does the foreign interest rate play an important role in determining the demand for money function of an open economy? Hamburger used the foreign interest rate to measure the degree of substitution between domestic and foreign assets.

Quarterly data run from 1963 to 1970 were employed in this study. The empirical analysis is based entirely on a fairly standard narrow definition of money for both countries. Hamburger's basic form of the demand equation for M_1 of Germany is:

$$M_1 = a_1 0 - a_2 r_{s-1} + a_3 Y + a_4 [1/7 \ ^7 Y_{t-1}] - a_5 D_1 - a_6 D_2 - a_7 D_3 \ \ldots \ (1)$$

where

M_1 is the narrow money definition

r_s is the interest rate on three-month loans in the Frankfurt money market (measured on a quarterly average basis)

Y is the nominal GDP

D_1, D_2 and D_3 were introduced to account for any residual seasonal variation

The major empirical findings obtained from estimating the above equation indicated that the coefficients of the income and interest rate were significant with right sign. Hamburger then used the foreign interest rate (r_F) instead of r_s (the interest rate on three-month loans in the Frankfurt money market) to measure the degree of substitution between domestic and foreign assets and hence to test the hypothesis that in an open economy the domestic money stock is not fully subject to the control of the central bank. He discovered that the two sets of results (obtained from equations 1 and 2) were very similar. He pointed out that when R_s and r_F were included in the same equation only r_s was

found to be significant. This implies that money is a closer substitute for domestic securities than it is for foreign securities.

Hamburger's basic short-run money demand equation of M_1 for the U.K. is:

$$M_1 = a_1 - a_2 r_{LA} - a_3 r_E - a_4 r_E + a_5 Y + a_6 M_{t-1}$$

where

M is the logarithm of currency in the hands of the public plus sterling current accounts of the U.K. private sector

Y is the logarithm of gross domestic product (GDP) at current prices r_{LA} is the interest rate on local authority three months debt

r_E is the dividend-price ratio on ordinary shares

r_U is the uncovered rate on three-months Eurodollar deposits

The empirical results obtained from estimating the above basic equation indicated that all the explanatory variables are significant with right signs, except r_{LA}, the long run income elasticity is less than unity (0.70). The adjustment coefficient (λ) is 0.808 implying a relatively low speed of adjustment. Hamburger pointed out that the most unexpected result was the overriding effect that the Eurodollar rate has on the quantity of money demanded. This leaves little doubt that Britain is an open economy and that, in a regime of fixed exchange rates, control of the domestic money stock may be difficult. This may also suggest that foreign securities may be good substitutes for domestic money. Furthermore, the result confirms that the Eurodollar rate provided a very good measure of the opportunity cost of holding money in Britain.

In conclusion, Hamburger indicated that in light of the empirical results, it seems likely that the Central Bank in the U.K. and Germany

is unable to stabilize interest rates and pursue an independent monetary policy, even if only for a short period of time.

Bought (1979) examined some of the principal theoretical and empirical issues associated with the specification, estimation and testing of the stability of the money demand function for seven major OECD countries (United States, Canada, France, Germany, Italy, Japan and the United Kingdom).

Bought's study, like most other recent empirical studies on the demand for money, is based on quarterly data and on two or three conventional definitions of money. The basic definition M_1 consists of currency plus demand deposit at commercial banks. Broader definitions, which are known variously as M_2 or M_3, include all or part of interest-bearing saving deposits. Bought took into account the differences in the definition of these countries, particularly the broad definition. He used a standard money demand equation in the form of a first order (Koyck) partial adjustment model. The final form of Bought's money demand function can be written as

$$(M/P_t) = a_0 + a_1 Y_t + a_2 r^m_t + a_3 r^o_t + a_4 I_t + a_5 E_t + a_6 (M/P)_{t-1}$$

where

Y is the real income (GNP and GDP in constant prices)

r^m_t is a 'market' interest rate, either a money market rate or a bond yield

r^o_t is an 'other' interest rate (saving or time deposits, or Euroedollar deposits).

Bought pointed out that these latter rates, as well as exchange rate changes (E_t) are included only where they contribute significantly to the equation estimated. It is the rate of inflation. $(M/P)_{t-1}$ is the lagged dependent variable. $(M/P)_t$ represents the real money stock of

the narrow and broad definition (M_1/P, M_2/P and M_3/P). The coefficients were estimated by OLS method. Finally the equations in this study were formulated in logarithmic form.

This study revealed that the estimated demand equations for M_1 of the U.S. and Italy were not fully acceptable as estimates of the demand for money (M_1) in these countries. However the estimates obtained from the estimated equations for M_1 for the remaining countries were found to be insignificant except the inflation rate in Canada. The international variables (foreign interest rate and exchange rate) were found to be insignificant in these countries. The elasticities of the demand for money (M_1) with respect to income, interest rates (short-term market interest rates) and inflation rates for Canada, France, Germany, Italy, Japan and the United Kingdom are presented in the following table:

	Income	Interest rate	Inflation
	Long-run elasticity	Long-run elasticity	Long-run elasticity
Canada	0.79	-.19	-.02
France	0.90	-.33	-.09
Germany	1.08	-.15	-.02
Italy	2.43	-.41	-.25
Japan	1.07	-.38	-.09
U.K.	1.32	-.51	-.17

In the case of the United States the adjustment coefficient exceeds unity, therefore no elasticities can be calculated. As far as the empirical results of the demand for M_2 and M_3 are concerned, Bought found that the income, interest rate (money market interest rate) and inflation rate, apart from the market interest rate in Italy, are

significant. The external variable (foreign interest rate, exchange rate) generally were found to be not important; in no case was the exchange rate found to be significant; the Eurodollar rate was found to be significant only in Canada.

Bought employed the Chow-Fisher test to determine the stability of the money demand functions in these countries. The period of the study was divided into two sub-samples. The first sub-sample covered the period from 1960 to 1973 and the second from 1974 to 1977. The test showed that it was possible to judge which money demand functions in these countries appear to provide the more useful policy information. The results showed that overall the broader definition tends to forecast somewhat better than the corresponding M_1 functions, the exception being M_3 functions for Germany and the United Kingdom. In these two cases, the M_1 functions were stable and outperformed the apparently unstable M_3 estimates. In the United States case, it was found that the shift in the demand functions for M_2 is minor. By contrast, the money demand functions for M_1 was found to be unstable and its forecast very poor.

Another important empirical study on the demand for money in major OECD countries (United States, Canada, France, Germany, Italy, Japan and the United Kingdom) was conducted by Blundell-Wignall, Rondoni and Ziegelschmidt (1984). This study was undertaken to re-estimate traditional money demand functions which have been used to estimate the demand for money in these countries. (See, for example, Bought 1979). Furthermore, the study aimed to provide an explanation of the large swings in velocity of these countries during the 1970s and 1980s. Quarterly data running from 1973 Q_3 to 1983 Q_1 was employed and the narrow and broad definitions of money (M_1, M_2 and M_3) were used in this

study.

The standard specifications used in the analysis of the money demand in these countries is a first order (Koyck) partial adjustment model towards long-run real money demand (M/P) of the following form. The final form of the money demand function of this study can be written as follows:

$$D \ln M/P = \text{Const} + a_1 \ln Y + a_2 \ln(1+r) + a_3 D \ln P^e + a_4 \ln(M/P)_{t-1}$$

where

M = money stock

Y = real income

r = short-term interest rate

P^e = expected price level

P = price level

$(M/P)_{t-1}$ = lagged dependent variable

D = d/dt

Blundell-Wignall, Rondoni and Ziegelschmidt stated that:

> the economic agents may hold money balances instead of financial assets. A market interest rate is normally used as an opportunity cost argument of estimated money demand models. However, in recent years financial innovations (particularly in the United States and Canada) pose difficulties in principle for identifying stable opportunity cost arguments, even for narrow M_1 aggregates. In particular, the introduction of chequing deposits that pay a return may alter the interest rate's elasticity of money demand. This has always been a problem with estimating equations for M_2 and M_3 demand which include various time deposits that pay interest. These difficulties have been further increased when one considers the changes in the range of services offered by banks in most countries in recent years. These imply the possibility of shifts of the non-pecuniary return on holding various types of bank deposits.

Therefore, they suggested that the correct opportunity cost argument for

inclusion in money demand equations might be considered to be as follows:

$$(1+r)^2 = (1+r)/(1+r_1+r_2)$$

Where r_1 is the pecuniary return on bank deposits and r_2 is the non-pecuniary return (services, etc.)

Let us now summarize the main empirical findings of this study. The estimated money demand equations for M_1 of these countries revealed that in the case of the United States, the partial adjustment coefficient (-.005) gave rise to highly implausible results. Furthermore, the real income elasticities of Japan and the United Kingdom were poorly determined. The Durbin h-Statistic suggested the presence of autocorrelation in the residuals of the demand equation for M_3 in France. In the following table the short-run elasticities of the real income, interest rate, and expected inflation for narrow money demand (M_1) are presented only when they are significant.

	a_1	a_2	a_3
Japan		-.378 (3.54)	-.205 (2.42)
Germany	.388 (3.77)	-.571 (7.43)	-.181 (2.29)
France	-.207 (3.771)		-.430 (3.79)
U.K.		-.628 (-6.84)	-.204 (-8.44)
Italy	-.183 (2.96)	-.542 (4.45)	-.168 (2.82)
Canada	-.103 (2.32)	-.494 (-3.44)	

Moreover, the empirical results that emerged from estimating the demand equations for M_2 revealed that satisfactory results were obtained only

for the United States. For all other countries the parameters were insignificant, of an inappropriate sign and/or gave rise to implausible long-run elasticities. A similar picture emerged in the case of M_3. The equation is broadly acceptable for the United States, but for all other countries the results were unsatisfactory. However, for M_3, reasonable estimates were obtained for the United States, France and Germany.

As far as the stability of the demand equation of M_1, M_2 and M_3 is concerned, the Chow-Fisher test indicated that the majority of these equations passed this standard stability test. For the United States, the hypothesis of stability was rejected only for the M_2 and M_3 specifications without the inflation expectation term. Conversely, the demand equations for M_2 and M_3 excluding the inflation term were found to be stable for France. For Italy, all M_1 and M_3 equations, without inflation term, passed the Chow-Fisher test. For Canada, all M_1 equations passed the Chow-Fisher test, but all M_2 and M_3 equations failed. The recursive regression test, another stability test, was used in this study. Blundell-Wignall, Rondini and Ziegelschmidt pointed out that this test suffers from the arbitrariness of splitting the complete estimation period into two sub-intervals. Therefore this test was used to determine changes in the parameters that cannot be explained by random movements around a time-invariant true parameter value. The recursive regression test examines whether the normalized cumulative sums of recursive regression residual significantly differ from zero. The test showed that the demand equations for M_1, M_2 and M_3 passed the Cusum test in the United States and France. All M_1 equations passed this test for Japan, the United Kingdom and Italy. All the equations for M_1 and M_3 were satisfactory.

Several important issues stemmed from the literature review of this section. These issues are associated with specification of the demand for money in these countries. In the remainder of this section an attempt is made to highlight briefly these issues.

Firstly, an issue extensively examined in the literature is whether income or wealth (or perhaps permanent income) is the appropriate scale variable. Goldfeld (1973) stated that:

> Laidler has reviewed this literature and concluded that evidence favours wealth. Citing Meltzer, he suggests that once wealth is included, income has little to explain. Furthermore, he cites the work of Brunner and Meltzer that suggests that wealth has a superior predictive ability. However, the evidence cited by Laidler is based on long-term annual data while recent writings following the transactions approach have tended to be concerned with a short-term context. Thus Laidler's conclusions do not necessarily apply in explaining the short-run demand for money with quarterly data, and their robustness should be examined.

Heller (1965) used the interest rate as well as GNP and wealth for different definitions. His empirical results led him to conclude that wealth is more important as a determinant for time deposits while income is the appropriate determinant for cash and demand deposits, which reflect the respective motive for holding these balances. Nonetheless, numerous writers continue to follow the transaction approach which focuses on income as the primary scale variable.

The empirical measurement of wealth variable is not a straight-forward task. Friedman (1956) argued that the wealth concept should include not only the financial and physical assets, but also the present value of labour income or, as it has come to be called, human wealth. He indicated that the consolidation of non-human and human assets will reflect effectively the role of the wealth variable on the demand for

money. Wong (1977) pointed out that measuring the physical and human has been a problem not only in the less developed countries, but also in the developed countries. Many researchers have attempted to measure wealth. For example, Khusor (1952) and Grile and Barnett (1980) constructed a series on financial wealth to be used in their studies on the demand for money in Britain. However, this series represented a very narrow wealth concept. Laidler (1985) attributed the difficulty of measuring the wealth variable to at least two problems: the first problem relates to determining how much consolidation there should be of disaggregated wealth data when producing an aggregate figure; the second problem related to the unavailability of sufficient detailed data on non-human wealth measured over a time span long enough to be useful for empirical research.

Friedman (1956) denied the validity of formulation of the demand-for-money relationship in which the transaction motive for holding money is important and consequently current income is the appropriate scale effect on the demand for money. He contends that the asset motive predominates and thus only that part of income which is considered as permanent influences the demand for money. Friedman concluded that the expected income should enter into the relationship as proxy for expected yield on wealth. Furthermore, the expected (permanent) income has been widely used as a proxy variable for the expected yield on wealth by many researchers from developed and less developed countries. This is largely due to the difficulty of measuring the wealth variable.

Secondly, choosing an appropriate opportunity cost variable in the developed countries has often been regarded as a contentious issue. Hamburger (1977) pointed out that finding the appropriate measure of the

opportunity cost of holding money centred on choosing between the short- and long-term yields of the financial assets. Goldfeld (1973) pointed out that the major dispute has been concerned with the yields on short-run financial assets such as commercial papers, Treasury bills, etc. versus the yields on long-run financial assets such as corporate bonds, U.S. government obligations and equities. Some economists argue that the long-rate yields of the financial assets, because they are more representative of the average rate of return on the capital in the economy, are better indicators of holding money. Others believe that the yields on short-run financial assets are a better measure of the opportunity costs of holding assets other than money, because these assets are closer substitutes for money than financial assets with long maturity. Laidler (1985) mentioned that there is merit in both these arguments, but they ignore the fact that much work has been done on the problem of the term structure of interest rates, and the interrelation-ship of yields on assets of varying maturity.

As far as the rate of return on money is concerned, a great majority of empirical studies have treated money, whether broadly or narrowly defined, as bearing interest at a zero or at least at an unvarying rate which can therefore be ignored. This is simply not true, especially in the developed countries. Laidler (1985) pointed out that the demand deposits in most of the industrial countries bear interest and the variation in the rate of return they yield ought to influence the demand for money so that it is defined broadly enough to include them. Therefore the rate of return of these deposits should be taken into account more precisely in measuring the opportunity cost of holding money.

The role of expected inflation in demand for money, particularly in the developed countries, is a controversial issue. The question of

whether the expected inflation has an independent and important role to play in the demand function in these countries remained unresolved. Jonson (1976) pointed out that in theoretical writings on the demand for money functions in the Chicago tradition, money serves as an alternative for physical goods, and the expected rate of a price change is given a prominent role. This approach is supported by empirical evidence from hyperinflation abroad. On the other hand, Adekunle (1968) indicated that the expected rate of inflation has not been found to play a significant role in the money demand relationships estimated for the United States. For other developed countries, the expected inflation has been found to play a significant role only in situations character- ized by violent upward movements in price levels. However, Goldfeld (1973) found the expected inflation in the United States to be quite significant with negative signs.

Many empirical studies have investigated the behaviour of the demand for money and use the interest rates as proxy measures for the yields of financial assets. These rates, which are invariably market rates, may already incorporate expectations as to movements in prices. For not only money balances but also, as has been noted above, holdings of these types of financial assets are influenced by expectations about price movements. Thus, in a situation where prices are expected to change, the real interest is adjusted by the expected rate of inflation to give the expected market interest rate. As such it would be difficult to isolate the influence of the expected inflation in a multiple relationship which includes the market interest rate. In short, in developed countries, where their economies are well integrated and markets, including the financial market, are nearly perfected, the expected rate of inflation is more likely to be reflected in the market rate of interest.

4.2 A REVIEW OF THE LITERATURE ON THE DEMAND FOR MONEY IN THE LESS-DEVELOPED COUNTRIES

Some hypotheses of the demand for money in developed countries are more likely to be unapplicable for empirical testing of the demand for money in less-developed countries. This is largely due to the structural, institutional, economic and social differences between developed and less-developed countries. In recent years, many economists have questioned the applicability of the Keynesian liquidity preference theory to less-developed countries, and it has become obvious that it is irrelevant to the financial and monetary problems of less-developed countries such as, limited financial assets, lack of well-developed financial markets, etc. Y. C. Park (1973) pointed out that there is money, on the one hand and there are real physical assets on the other hand: there is little in between. Therefore most of the empirical analysis of the demand for money in the less-developed countries rests on the theoretical structure of the modern quantity theory of money.

Empirical researches on the demand for money in the less-developed countries have aimed to answer some basic questions such as: What is the most appropriate definition of money stock? What are the appropriate specifications of an income and an opportunity cost variable? Is the demand function for money stable over time? In this section, we will examine some of the literature on the demand for money in the less-developed countries and briefly highlight some factors that influence the behaviour of the demand for money in these countries.

In 1968, Adekunle carried out an extensive empirical study which

dealt with the demand for money in three groups of countries: the industrial countries (Canada, Denmark, France, Germany, the Netherlands, Norway, Sweden, Switzerland and the United States); some other developed countries (Australia, New Zealand, South Africa and Turkey); and several less developed countries (Ceylon, Republic of China, Costa Rica, India and Mexico). Adekunle sought to answer several questions, such as: Are the expected variables, for example, the expected real income and expected rate of inflation, more appropriate in the sense that expect - ations are less static in the demand relationship of the developed rather than in that of the less-developed group of countries? Is the income elasticity of the demand for money higher in the less-developed countries than in developed economies? Are the opportunity costs of holding money involving real assets more important in the less-developed countries? Can all substitution effects be subsumed under those of financial assets in the developed countries?

Adekenle employed Nerlove's expectation function to estimate the expectation elasticities with respect to the real income and rate of inflation (λ_1 and λ_2) and to generate the expected values of the real income and rate of inflation. The narrow and broad money definitions (M_1 and M_2) were used as dependent variables. Moreover, three single equations were constructed to measure the relationship of the demand for money in these groups. The first equation included three explanatory variables, the real income, rate of inflation and interest rate (Adekunle assumed here that the expectations were static, i.e. $\lambda_1 = \lambda_2 = 1$. In the second equation, the expected rate of inflation replaced the actual rate of inflation where the other variables remained the same. In the third equation, both the expected real income and expected rate of inflation replaced the actual real income and actual rate of

inflation.

The main empirical results of Adekunle's study can be summarized as follows: real income was positively related to real balances and its coefficient was significantly different from zero in less-developed countries; the price variable was also found to be significantly different from zero with right sign in these countries except in Mexico; the sign of the interest rate was the correct one in three of these countries (Republic of China, Costa Rica and Ceylon), but its coefficients were insignificant; finally, the real money balances in less-developed countries was significantly related to the expected rate of inflation. As far as the empirical results of the industrial countries are concerned, the expected income and interest rate were found to be significant with right sign in these countries. The price variable was also generally found to be significant in these countries. Finally, in almost all developed countries, the income and the interest rate were found to have a significant role in determining the demand for money. On the other hand, the expected rate of inflation was generally found to play a minor role in explaining the variances in money balances.

An empirical experiment on the demand for money using a group of Asian countries (Korea, Philippines, Sri Lanka, Taiwan, Thailand) was carried out by Wong (1977). Wong's main concern was to construct a demand for money model theoretically more tenable and empirically more applicable to developing countries in general and to examine the role of credit restraint as a proxy variable for interest rate in these countries where interest rates are inoperative. He also sought to shed light on the role of the expected inflation in the demand for money in

the developing countries. He argued that a large number of empirical researchers have used the expected rate of inflation as a proxyexplanatory variable in the demand for money function to measure theopportunity cost of holding money. This is because the choice of wealth owners in these countries is often restricted to holding either money or real goods such as land, houses, consumer durables, agricultural commodities, etc. In these circumstances the expected rate of inflation would be a more appropriate proxy variable for the opportunity cost of holding money in comparison with the expected nominal interest rate which would be more relevant when the substitution between money and other fiancial assets is considered. Wong indicated that the interest rate generally does not have a significant role in determining the demand for money in the developing countries. This may be attributed to at least three factors: firstly, the non-organized money market; secondly, direct borrowing is still a means of financing economic activities in these countries; thirdly, interest rates are closely controlled by the monetary authorities.

Wong argued that the interest rates in the non-organized money market, although non-observable, would reflect the degree of credit restraint in an economy. Therefore, he suggested that credit restraint can be treated as a proxy variable for interest rate variable in the demand for money function in these countries. Moreover, he pointed out that there are several proxy variables for credit restraint, such as the negative of the ratio of domestic credit to income, the reciprocal of the credit multiplier, the rate of increase in bank debit, the bank debits to income ratio, the difference between the rate of reserve money and the rate of growth of bank credit.

Wong's statistical experiments were made in several stages. At the first stage, all proxy variables for the degree of credit restraint were tried along with the income variable in both linear and logarithmic single equation. The most desirable equations for each 'country were then selected and additional variables, such as the expected rate of inflation, introduced at the second stage. At the third stage, the final single-equation regressions were obtained for each country and attempts made to deal with the problems of auto-correlation and simultaneity. The general form of Wong's model is:

$$M_t = f(y^e, CR^e, P^e, M_{t-1}, E)$$

   where

   M_t = money stock (currency in circulation plus demand deposits)

   Y^e = the expected nominal GNP

   CR^e = the expected index of the degree of credit restraint

   P^e = the expected rate of inflation

   M_{t-1} = lagged dependent variable

   E = error term

The major finding of Wong's study can be summarized as follows: Firstly, the negative of the ratio of domestic credit to income was found to be the most appropriate proxy variable of credit restraint in Korea, the Philippines and Sri Lanka (its coefficient was significant at the 1 per cent level in these countries); the negative of the rate of domestic credit expansion was found a very suitable proxy measure of the credit restraint in Taiwan; the reciprocal of the credit multiplier was an appropriate proxy measure of credit restraint in Thailand (its coefficient was significant at the 5 per cent level); the rate of increase in bank debit was found to be significant at the 5 per cent level in the Philippines, Thailand and Korea. Secondly, real income was generally found to be very significant with long-run elasticities around

unity in most of these countries. This seems to suggest that the transaction motive plays a very important role in determining the demand for money in these countries. Thirdly, the expected rate of inflation was found to be insignificant without the lagged dependent variable except in Thailand. However, when the expected rate of inflation was included together with the lagged dependent money variable, it became significant in all the countries except the Philippines.

Ahmed (1977) carried out an empirical study on the demand for money in Bangladesh using annual data for the period 1959 to 1976. He used a simple model consisting of real income, the rate of interest, a lagged income variable, the actual rate of inflation and a dummy variable representing structural change, as explanatory variables, and a narrow money definition (M_1) as a dependent variable.

The major findings of this study can be summarized as follows:

1. The interest rate has an insignificant effect on the demand for money;

2. Income was found to be very significant with right sign. Its elasticity of the demand for money is greater than one;

3. The coefficient of the inflation variable is statistically insignificant;

4. The dummy and lagged income were found to be significant explanatory variables, with a positive impact on the demand for money.

Crockett and Evans (1980) conducted an empirical study on the demand for money in Middle Eastern countries. A simple double logarithmic model was fitted to a relatively short period of annual data of these countries. The model included one scale variable (income) and

one opportunity cost variable (rate of inflation). The non-oil GDP was used as a measure of the income in oil-exporting countries and the GDP was a measure of the income in other countries. Moreover, the import price index was used to measure the inflation in Jordan and Oman, the GDP deflator used to measure the inflation in Egypt, Ethiopia, Lebanon and Pakistan, and the non-oil GDP deflator used as a measure of inflation in oil-exporting countries (Bahrein, Iran, Iraq, Kuwait, Libya, Saudi Arabia and the United Arab Emerites).

The major empirical findings of this study can be summarized as follows: the demand equations for broad money (M_2) of these countries were generally better determined than those for narrow money. These equations (for broad money) were reasonably well determined in the sense of having high explanatory power $(R^2$ close to or higher than 0.8, and in many cases 0.9), reasonably small standard error of estimate (generally lower than 10 per cent, often around 5 per cent), and only limited evidence of serial correlation. The income coefficients with respect to the narrow and broad money definitions were found to be highly significant in nearly all cases, and the short-run income elasticities of these countries for narrow and broad money fell in the range between 1.00 and 1.5, and 1.25 and 1.5 respectively. As far as the expected inflation is concerned, Crockett and Evans pointed out that the influence of the expected inflation on the demand for money proved difficult to detect. In only three cases - Iran, Saudi Arabia and Jordan - out of nineteen was the inflation variable found to be significant and of the correct sign. Moreover, they indicated that although these results cannot be taken to contradict the hypothesis that the demand for money is sensitive to expected inflation, they do not provide any firm basis for conclusions about its quantitative importance.

A study by Khan (1980) analyzes the demand aspects of the money market and examines the determinants of money in Pakistan over the period 1959 and 1978. Khan argued that in most developing countries, a great portion of total income originates through non-monetary transactions and barter trade. This proportion usually declines with economic development, therefore the demand for money will increase partly because of income growth and partly because of a rise in the degree of monetization. Moreover, Khan indicated that monetization is an important determinant of growth in the demand for money over time. Partial adjustment models were used in this study to estimate the demand for money in Pakistan. As explanatory variables, Khan used the current income (or permanent income), expected rate of inflation and the degree of monetization. (The number of bank branches was used in the study as a proxy for monetization). The primary results of the study can be summarized as follows:

1. The expected rate of inflation and the degree of monetization explained 99 per cent of the residual variation in the demand for money, after taking income and the interest rate on time deposits into account;

2. The actual income and permanent income have nearly equal statistical significance and elasticities, implying that there is no difference between the permanent and actual income in Pakistan.

3. The conventional equation used in the study exhibits no market instabilities for either M_1 or M_2;

4. The actual and desired money balances were partially adjusted, the adjustment coefficients ranging from .36 to 53 depending upon the definition of money.

The most recent study on the demand for money in some OPEC countries, namely Saudi Arabia, Libya and Nigeria, was carried out by Darrat (1986). His main objective was to determine the most appropriate money demand functions for these countries and to test their stability. Quarterly data runs from 1963 to 1979 were used to estimate the demand for money. Moreover, three different money definitions M_0 (currency in hands of the non-bank public), M_1 (M_0 + demand depositis), and M_2 (M_1 + time and saving deposit) were employed.

The general form of Darrat's function is:

$$(M/P) = f(X^{+e}, R^{-e}, r^e)$$

where

X^e = the expected real income

R^e = the expected rate of inflation

r^e = the foreign interest rate.

Darrat used the Almon-log process to represent the lag structure in the money demand function whereby each independent variable is replaced by a distributed lag variable of its own past and current values. Darrant highlighted two analytically important comments on the specification of his function. These briefly are: firstly, in the developed economies, physical and financial assets are sufficiently available and thus both are viewed by money holders as attractive alternatives to cash balances in their wealth portfolio. Therefore the opportunity cost of holding money should consist of the expected inflation rate and some market interest rate. By contrast, the less-developed countries, including the OPEC members, have a very limited

number of financial assets. This is largely due to the fact that the financial markets, outside the commercial bank, are undeveloped. This implies that there is very little substitutability between money and financial assets. Moreover, the authorities in developing countries usually control the market interest rate either directly or indirectly; therefore changes in these rates are very infrequent. Consequently the expected inflation rate has been widely used as an appropriate proxy measure of the opportunity cost of holding money balances in the developing countries. Secondly, Darrat argued that in open economies with at least some international capital mobility, international opportunity costs of holding money balances can be as important as the domestic counterpart. He indicated that this argument appears to be especially relevant to developing open economies because of the lack of adequate domestic financial assets in these countries. Thus the influence of the international financial markets as summarized in the movements of foreign interest rate on the money stock should be taken into account in determining the demand for money function in these countries. Thirdly, Darrat argued that in the absence of diverse financial assets in the open countries under investigation the alternative definitions of money are limited to three monetary aggregates: firstly, the currency in the hands of the non-bank public, M_0; secondly, M_1 (M_0 + demand deposits); thirdly, M_2 (M_1 + time and saving deposits). Some researchers may question the distinction between M_0 and M_1 since currency and demand deposits are considered almost perfect substitutes as transaction balances. However, Darrat indicated that in most developing countries such a distinction seems reasonable because it is mainly currency that fulfills the transaction role, whereas demand deposits are mainly used for safety purposes.

Only the most appropriate estimated functions, in the sense of having high explanatory power (high R^{-2}), a very small standard error, and no evidence of serial correlation, were presented in this study. As far as the empirical results are concerned, Darrat found that his general model fitted the data of these countries quite well and the hypothesized variables contributed significantly to the explanation of the behaviour of real money demand. Moreover foreign interest rates exert a strong effect on real money demand in both Saudi Arabia and Nigeria in terms of long-run elasticities. Regarding the influence of the expected rate of inflation on the demand for money in these countries, the study showed the expected rate of inflation found to be highly significant, but its long-run elasticities are very small. Finally, the expected income was found to be highly significant.

The literature reviewed in this section throws light on some important factors which, it is believed, have an important influence on the behaviour of the demand for money in the developing countries. In the remainder of this section these factors are highlighted briefly:

Firstly, the economic, political and social instability and the imperfection of knowledge and markets in less-developed countries lead to a high degree of risk and uncertainty. For example, most less-developed countries, because of their greater dependence on the export of a few goods, mainly raw materials, and the import of capital, are susceptible to externally-generated fluctuations in income levels and in the level of economic activity. One would therefore expect that the expectations with respect to income and rate of change in prices would play an important role in the demand for money in these countries. Wong (1977) mentioned that it is more likely that the elasticities of the expected rate of inflation and income will be higher and more

significant in the less-developed than in developed countries. Furthermore Goldfeld (1976) pointed out that the expected rate of inflation has not been found to play a significant role in the money-demand relationship estimated for the United States. For other developed countries, price movements have been found to play a significant role only in situations characterized by violent upward price movements, whereas the behaviour of the demand for money in the less developed countries is generally found to be significantly influenced by the expected rate of inflation. Adekunle (1968) indicated that the high degree of variability in income and rate of change in prices in less-developed countries was due to high risk and uncertainty. This implies that theior elasticities of expectation, as generated by the adaptive mechanism which essentially reflects the proportionate errors associated with previous levels of expectation, will be larger than the corresponding ones in the developed economies.

Secondly, as previously mentioned, the money and capital markets in less-developed countries are undeveloped and very limited in size. There are only a few organizations dealing with financial instruments such as bills, commercial papers and bonds. Moreover, government short-term securities and corporate stocks are often virtually non-existant. Hence these countries have very few financial assets and so there is a very limited degree of substitution between financial assets and money balances in comparison with the developed countries. Adekunle (1968) pointed out that the ratio of the value of total assets to the value of national wealth is much higher in the developed than in the less-developed countries simply because there are sufficient financial assets in the developed economies that can satisfy the liquid asset motive associated with increase in real income or wealth. One would therefore expect that the motive of holding physical assets plays an important

role in the behaviour of the demand for money in the developing areas, whereas the motive of holding financial assets play a minor role in the demand for money.

Thirdly, many researchers have argued that interest rates in the developing countries are closely controlled by the authorities. Consequently, data on the interest rates would not genuinely reflect market forces, nor would they exhibit sufficient variation over time to detect empirically a systematic relationship and, finally, they would not reflect the changes in price levels. Because of this argument and the fact that the motive of holding financial assets has a negligible effect on the demand for money in these countries, the expected rate of inflation has been widely used as an appropriate proxy variable for the opportunity cost variable in the money demand function of developing countries. Adekunle (1968) argued that since one important reason for holding money is that it has a store of value characteristic, when prices are expected to increase money loses some of this attribute. Money-holders will tend to adjust their holdings in order to minimize losses that may result from the expected decline in the purchasing power of money. Some of this adjustment will involve the replacement of money by physical assets. Moreover, Adekunle pointed out that the rate of changes in prices represents appropriate proxy measures for the yields of the physical assets. Wong (1977) pointed out that the expected rate of inflation was found to be generally significant in determining the demand for money in less-developed countries. The empirical evidence obtained from some OPEC countries (see Darrat 1984) showed that the expected rate of inflation plays a significant rate in the demand for money in these countries.

4.3 A REVIEW OF THE LITERATURE ON THE DEMAND FOR MONEY IN SAUDI ARABIA

Saudi Arabia offers a unique environment for studying the demand for money. It is an Islamic and developing country with an open economy where there is no restriction on capital movement and trade. The rate of interest is not recognized officially as a price regulator in the money market (interest on any type of loan or deposits and for whatever value is prohibited by Islam). However, the commercial banks and other economic agents are not legally forbidden to engage in interest-based activities; furthermore, official statistics report separate data on demand deposits and time and savings deposits at domestic commercial banks - evidence of the existence of interest-based transactions in Saudi Arabia. The Saudi economy, like other developing economies, exhibits many characteristics of underdevelopment, such as the lack of an organized money and capital market, limited absorptive capacity, and the dependence on one primary commodity, viz., oil. Several consequences emanating from these factors are believed to have an important effect on the behaviour of the demand for money in Saudi Arabia. These can be summarized as follows:

Firstly, the lack of discount operations, certificates of deposit, and other debt instruments have somewhat limited SAMA's ability to effectively manage domestic liquidity and control the banking interest rate (see Chapter 3). This in turn means that SAMA has no effective means of affecting the demand for money in Saudi Arabia. However, the introduction of the Banking Security Deposit Accounts for 1984 and, more recently, the treasury bonds (in early 1988 the Ministry of Finance and National Economy was authorized to borrow not more than

RIs 30 billion during the fiscal year 1988/89 through issuing treasury bonds) are considered very important steps forward, regulating the domestic liquidity and increasing SAMA's ability to control the banking interest rate.

Secondly, financial assets represent a very small proportion of the Saudi investors' portfolio, and this implies that the physical assets represent a strong substitution of the financial assets (see Tobin 1965). One would therefore expect that the motive of holding physical assets play an important role in determining the demand for money in Saudi Arabia. The empirical findings of several recent important studies on the demand for money in Saudi Arabia (see, for example, Darrat 1984 and 1986) suggested that the expected rate of inflation (as an appropriate measure of the yield of the physical assets) exert significant influence on the demand for money.

Thirdly, in an open economy like the Saudi economy, with no restrictions on capital movement and a lack of adequate domestic financial assets in which to hold wealth, the international opportunity cost of holding money can be as important as the domestic opportunity cost of holding money balances. Darrat (1984) pointed out that given the openness of the Saudi economy, researchers should take into account the possible effects of external monetary and financial factors as summarized by foreign interest rates and movements in the exchange rate betwen the Saudi money demand function. Presley (1985) stated that

In 1978 there was a general feeling in Saudi Arabia that the dollar would appreciate against Saudi riyal combined with higher interest rates abroad, particularly the US interest rate, led to a running down of domestic bank deposits in preference for dollar deposits; this created a severe shortage of bank liquiidity which SAMA had to remedy by lowering liquidity requirements

Increasing empirical evidence has emerged from several recent studies on the demand for money in Saudi Arabia (see, for example, Darrat 1984 and 1986; Presley, 1985) shows that external factors (foreign interest rates and exchange rates) do play an important role in the Saudi money demand function. This indicates that the Saudi asset holders do take into account external monetary and financial developments in their portfolio decisions. Therefore, the Saudi monetary authorities should not ignore the response of domestic money demand to these external factors when formulating their stabilization policies.

Fourthly, as previously mentioned, Saudi Arabia as a developing country shares most of the economic conditions of other developing countries, such as dependence on the export of a few goods (oil in the cause of Saudi Arabia), importation of most of their needs, an integrated economy, and market imperfections. These conditions cause severe fluctuations, in income, level of economic activity, government expenditure, money supply and price level. It seems apparent, therefore, that expectations play an important role in behaviour of the demand for money in Saudi Arabia.

In the remainder of this section, several recent empirical studies on the demand for money in Saudi Arabia are reviewed.

Darrat (1984) aimed to examine empirically the demand for money in Saudi Arabia over quarterly period, 1961/2 and 1981/4, and to test the stability of the Saudi money demand and functions. He argued that the interest rates in less developed countries are closely controlled by the monetary authorities, and therefore in general never exactly reflect market conditions nor would they exhibit sufficient variation over time to detect empirically a systematic relationship between money demand and

interest rate. The foregoing arguments hold strongly in the cause of Saudi Arabia, where data on interest rates are not available. Hence the expected rate of inflation is used in this study as a proxy variable for the opportunity cost of holding in Saudi Arabia. Moreover, Darrat pointed out that because of the openness of Saudi economy, the effect of the external factors (foreign interest rate and exchange rate) on the demand for money should be taken into account in this study.

Darrat used the Koyck partial adjustment procedure to form his function. This procedure assumes that the adjustment of actual real money demand to the desired level is only a fraction of the gap between the desired level in the current period and the actual level in the previous period. Darrat's final form of the money demand function can be written as:

$$\ln(M/P)_t = b_0 + b_1 \ln Y^P_t + b_2 \ln inf^e + b_3 \ln rf^e_t + b_4 \ln E^e_t + b_5 (M/P)_{t-1} + E_t$$

$$b_1, b_5 > 0, \text{ and } b_2, b_3, b_4 < 0$$

where

(M/P) is real money balance, M is nominal money stock defined narrowly as currency plus demand deposits (quarterly figures of monthly averages), and P is the consumer price index index (1975=100).

Y^P_t is the expected income

inf^e is the expected rate of inflation

r^e_t is the expected interest rates

E^e_t is the expected exchange rate

The following table present the regression estimates of the money demand function for M_1:

Constant	Y^P	inf^e	rf^e_t	E^e_t	Lagged real M_1
	b_1	b_2	b_3	b_4	b_5

Short-run elasticity

0.015	0.478	-.032	-.252	.563	.570
(0.02)	(4.16)	(3.31)	(2.99)	(1.80)	(5.68)

Long-run elasticity	1.112	-0.074	-.586	-1.309	
Summary statistics	R =0.99	SEE=0.02079	DW=2.07	h=0.54	

The table shows that all the explanatory variables of Darrat's function were significant with right signs. These variables explain that about 95 per cent of the total variation in real money holding, i.e. the overall goodness of fit of the model, was excellent. The Durbin-Watson test indicated that there was no significant first order serial correlation in the residuals. The empirical results reported in the table possess several interesting and important features. The short-run elasticity of real money demand with respect to permanent real income was about half of what the corresponding long-run elasticity was near unity (1.11). Therefore there seems to be no evidence for long-run economies of scale in cash management in Saudi Arabia. Moreover, the expected rate of inflation exerted a negative and significant influence on the demand for money. This implies that the Saudis are sensitive to inflation and consequently they view real physical assets as an attractive alternative to monetary assets. Darrat indicated that the empirical results lend strong support to the hypothesis that external monetary and financial developments influence domestic money holdings. Foreign interest rates and exchange rate variables were both found to exert, as predicted, a negative and significant influence on Saudi money demand. Moreover, the short- and the long-run elasticities of real money demand with respect to foreign interest rates and exchange rate expectations were much higher than the corresponding elasticities with

respect to the domestic opportunity cost (inflationary expectations).The empirical result clearly indicated that the Saudi investors take into account external monetary and financial developments in their portfolio decisions.

Finally, the significant coefficient of the lagged dependent variable indicated that the adjustment of actual real money balance to the desired level was not instantaneous. This coefficient implies that about 43 per cent (1-0.57) of disequilibrium between desired and actual money demand was made up in one quarter (see the table above). This can be considered a relatively rapid adjustment.

An extensive empirical study examining the demand for money in Saudi Arabia was carried out by Nagadi (1985); the general form of his money demand function written in a logarithmic form is:

$$\ln(M_t/P_t) = B_0 + B_1\ln(Y_t/P_t) + B_2(INF) + b_3\ln(EUR) + B_4\ln(M_{t-1}/P_{t-1})$$

where

Y = current income

INF = actual rate of inflation

EUR = London Eurodollar interest rate

M_{t-1} = lagged dependent variable

Nagadi estimated that the money demand relationship of Saudi Arabia using annual data from 1964 to 1983 and the money definitions, M_1 and M_2.

The primary empirical findings of this study can be summarized as follows:

1. The basic model was estimated using the non-oil GDP deflating by non-oil GDP deflator and the rate of inflation. The results indicated that the non-oil GDP was highly significant for M_1 and M_2. Its elasticity with respect to M_1 and M_2 were 1.07 and 1.2 respectively. Though the inflation rate was significant, its coefficients with respect to M_1 and M_2 were very small (-.0028 and -0.0022 respectively). The coefficients of the lagged dependent variable were low enough (.27 and .17) to give a high speed of adjustment (.73 and .83). The estimation showed that D-W statistic was far less than 2 in both cases (M_1 and M_2).

2. When government expenditure replaced non-oil GDP almost the same result occurred regarding the significance of income and inflation rate - both coefficients were highly significant for M_1 and M_2. However, the magnitude of income coefficient was much greater with M_1 than with M_2 (not as shown with non-oil GDP). This may indicate that government expenditure has a significant effect on M_1 components. Finally, the coefficients of the lagged dependent variable were relatively higher than those of the non-oil GDP (.59 and .71 for M_1 and M_2 respectively). The D-W statistic was found to be plausible.

3. The basic model was estimated using non-oil GDP and government expenditure, alternatively deflating the import price index and the rate of inflation. The estimation revealed that the income coefficients for both measures (non-oil GDP and government expenditure) were very significant but at the cost of the inflation rate; was found less significant with non-oil GDP and not at all significant with government expenditures. The

coefficients of the lagged dependent variable were found to be reasonable (0.51 and 0.89) implying a good speed of adjustment ranging between .51 and .89 and long-run income elasticities ranging between .86 and .95 for M_1 and M_2 respectively. The D-W statistic was higher with government expenditure than with non-oil GDP.

4.   When the Eurodollar rate as another opportunity cost of holding money replaced the rate of inflation in the same basic model, the coefficients of the two scale variables (non-oil GDP and government expenditure) were found to be significant in both cases (non-oil GDP deflator and import price index), while the coefficient of the Eurodollar rate was insignificant and some took the incorrect sign.

5.   The coefficient of the lagged dependent variable was plausible with non-oil GDP, implying a speed of adjustment ranging between .75 and .83, while for government expenditure the speed of adjustment was lower, ranging between 0.24 and 0.61.

6.   When both opportunity costs of holding money (rate of inflation and Eurodollar rate) were introduced in one equation, the scale variables (non-oil GDP and government expenditure) were highly significant. The t-statistics of both opportunity cost variables indicated that the rate of inflation was significant while the Eurodollar rate was insignificant.

Presley (1985) estimated the demand for money in Saudi Arabia using annual data runs from 1962 to 1981 and narrow and broad money

definitions (M_1 and M_3). He employed the Koyck partial adjustment procedure for his model. The final form of his money demand function can be written as follows:

$$\text{Log } M_t = a + B_1 \log Y_t + B_2 \log NF^e_{t-1} + B_3 \log EDR_t + B_4 \log XLIQ + (1-\lambda)\log M_{t-1}$$

> where
>
> Y is the real income (non-oil GDP)
>
> NF is the expected inflation
>
> EDR is the Eurodollar rate of interest
>
> XLIQ is the excess liquidity
>
> M_{t-1} is the lagged dependent variable

Several alternative formulations of the basic demand for money functions (the above function) were investigated. The major results of this study can be summarized as follows:

1.   The real income was found to be significant at the 1 per cent level in each of the regressions fitted. Moreover, its elasticity with respect to M_1 and M_2 was approximate (1).

2.   The Eurodollar rate of interest was statistically insignificant in each regression in which it was introduced.

3.   The excess liquidity was found to be significant with right sign (positive). These results support the argument that increased excess liquidity causes an increase in the demand for money as the opportunity cost of holding money falls. Moreover, Presley pointed out that the specialized credit institutions in Saudi Arabia since 1975 have affected the level of excess liquidity in the economy and restricted the lending opportunities of commercial

banks. Thus a dummy variable was introduced to allow for this effect. It took the value 0 prior to 1975 and 1.0 for all other data. The effect of this was to alter the elasticity of the demand for money with respect to excess liquidity between the two periods. The elasticities of the demand for money with respect to M_1 and M_3 were (1.969) and 1.033 for the period before 1975/6 and 0.678 (1.969-0.291) and 0.549 (1.033-0.484) for the period after 1975-6.

4.   The expected rate of inflation was found to be significant at at least the 5 per cent level in most cases. However, the introduction of a lagged dependent variable made the sign become perverse and the coefficient insignificant at the 5 per cent level when M_1 was the dependent variable.

The most recent empirical study on the demand for money in Saudi Arabia was conducted by Metwally and Abdelrahman (1987). In this study, the annual data runs from 1967 to 1982 with two money definitions (narrow definition M_1 and broad definitions M_2) were employed to estimate the money demand relationship in Saudi Arabia. Moreover, a variety of linear and non-linear (double-log) econometric models in static as well as dynamic form were tested. These models were incorporated by imposing a suitable partial adjustment mechanism upon the equation. This shows that the actual change in money demand is a proportion of the desired change in money demand. This adds to the list of explanatory variables the dependent variable in a lagged form (i.e. M_{t-1}). Furthermore, this introduction of the partial adjustment Koyck transformation distinguishes between short- and long-run behaviour of the demand for money.

Moreover, the structural shifts in the money demand functions were tested by using dummy variables (D and DY), which were employed to test for shift in the intercept and change of the slope of the income (Y) respectively. These variables took the value of zero during the period 1967 to 1973 (the period before oil embargo), and the value of one in the years 1974 to 1982 (the period after the oil embargo). The money balances and income were used in both current and real terms in order to gauge the effect of money illusion.

The general form of the money demand function in this study is:

$$M = (Y, r, (A/L), P^e)$$

where

M = demand for money

Y = income (either GDP or non-oil GDP)

A/L = ratio of assets to liabilities of the commercial banks

P^e = expected prices

r = the Eurodollar rate of interest

Metwally and Abdelrahman pointed out that 'the oil sector was responsible for some 40 to 50 % of GDP during the period 1967-82. Yet its contribution to the labour force was very mild. Hence its revenue filtered through the system directly to the government and a good portion of it found its way to the accumulation of reserves.' In other words, the transactions demand for money was a very small percentage of that revenue; therefore they distinguished between money demand functions for the whole economy and for non-oil sectors (non-oil GDP).

As far as the main empirical findings of this study are concerned, the regression result showed that the interest rate (Eurodollar interest

rate) was a significant determinant of the demand for M_1; moreover, the interest rate was found to play a stronger role in determining the demand for M_1 in the long-run than in the short-run. However, the interest rate was found to be insignificant in determining the demand for broad money (M_2) in the short-run, but did play a significant role in the long-run. Metwally and Abdelrahman pointed out that this result suggests that there has been a variation in the behaviour of the demand for narrow money and the demand for broad money and also indicates that in the long-run, the Saudis respond to the reward for departing with liquidity, something they could not do in the short-run because of the lack of organized money markets. The price expectations were found to be significant with right sign (negative) which indicates that the Saudis may tend to sacrifice liquidity for hoarding of goods as a means of a hedge against inflation. Moreover, the impact of the price expectation on the demand for M_2 did not differ from the case of the demand for M_1. Though the excess liquidity (as measured by the ratio A/L) did not have a significant effect on the demand for narrow money in the Saudi economy, its effect on the demand for broad money (M_2) was quite strong, but only in the short-run. Metwally and Abdelrahman's study indicated that the excess liquidity did find its way to international financial markets in the long-run. The coefficients of the lagged dependent variables for the demand equations for M_1 and M_2 possessed the right sign and values. The income variable (GDP and non-oil GDP) was found very significant with respect to the demand for M_1 and M_2 in almost all cases. Moreover, the long-run elasticities of the demand equation for M_1 and M_2 with respect to income were around 1.375 and 1.350 respectively.

The dummy variables (D and DY) were found to be significant in

respect of the demand for M_1 and M_2. This suggests that a change in both the intercept and the slope of the demand equation for M_1 and M_2 witnessed major structural shifts.

To conclude this section, several economic characteristics of Saudi Arabia have been highlighted. For example: (1) Saudi Arabia has a developing economy; (2) the Saudi financial markets outside the commercial banks are highly rudimentary. As a result of this, there are very few financial assets. This implies that there is a very limited degree of substitution between money and other domestic financial assets. (3) Saudi society is still considered to be a cash economy where most of the transactions are carried out with currency (i.e. the transaction motive plays a very important role in the behaviour of the demand for money in Saudi Arabia). Most importantly the Saudi economy is a very open economy with no restrictions on the movement of goods or funds.

Many earlier empirical studies on the demand for money in Saudi Arabia have taken into account these characteristics. Therefore there seems to be a wide agreement among researchers that a money demand function for the Saudi economy should include in its argument a measure of transaction in the economy. (In many empirical studies on the demand for money in Saudi Arabia, the non-oil GDP is used as a proxy measure for the transaction motive.) Secondly, the expected rate of inflation represents the domestic opportunity cost of holding money as an alternative to real assets. Finally, the foreign interest rate represents the international opportunity cost of holding money as an alternative to foreign financial assets. Given these arguments, an attempt will be made in this study to test empirically these hypotheses, together with the author's own hypotheses which are as follows:

Firstly, should the current income or expected income, as a proxy to wealth variable, be used in measuring the money demand relationship in Saudi Arabia?

Secondly, does the domestic interest rate exert a significant and negative influence in the demand for money in Saudi Arabia? (For several reasons which will be discussed in the next chapter, the Saudi domestic interest rate has never been used before in any empirical work relating to the demand for money, or in any other empirical works.)

Thirdly, does the movement in the exchange rate between the Saudi Riyal and foreign currencies (especially the US Dollar) exert a significant and negative effect on the demand for money in Saudi Arabia?

Fourthly, are the estimated money demand equations structurally stable over time?

CONCLUSION

In this chapter many empirical studies, endeavouring to explain, both theoretically and empirically, the behaviour of the demand for money in many countries with diverse economic characteristics, were reviewed. An important conclusion stemming from this discussion is that any theoretical specification of a money demand function should include in its arguments the measure of transactions in the economy (or a scale variable) and some measures representing the cost of holding money as an alternative to real and financial assets.

This chapter also sheds light on the fact that the behaviour of the demand for money in the developed and less-developed countries is to

some degree different. This fact could be attributed to the structural, institutional, economic and social differences that exist between these two groups of countries. Several major differences in the behaviour of the demand for money in developed and less-developed countries can be summarized as follows:

Firstly, strong liquid asset motives make for higher income elasticities in less-developed economies than in developed economies.

Secondly, the opportunity cost of holding money involving real assets, as approximated by the movements in the price level, are more important in less-developed countries than in developed countries.

Thirdly, in less-developed economies, most of the substitution effects may be subsumed under those of real assets, whereas most of the substitution effects in the developed countries may be subsumed under those of their financial assets.

Fourthly, the lag in expectation formation is longer in developed countries than in less-developed countries.

In the light of the previous empirical studies on the demand for money in Saudi Arabia, it seems that there is a general agreement among the researchers that a money demand function for M_1, M_2 of the Saudi economy should include the following explanatory variables: the current income, often approximated by the non-oil GDP; the expected rate of inflation representing the domestic opportunity cost of holding money as an alternative to real assets; and finally the foreign interest rate, particularly the US interest rate, representing the international opportunity cost of holding money as an alternative to foreign financial

assets. As to the dependent variables, two narrow money definitions (M and M_1) and a broad money definition (M_2) were used in these studies. The major empirical findings of these studies can be summarized as follows:

(1) The current income was found to be highly significant with a long-run elasticity around unity.

(2) In general, the expected rate of inflation exerts a significant and negative influence on the demand for money in Saudi Arabia. However, its long-run elasticity has been relatively low.

(3) In most cases, the foreign interest rate was found to be significant, noticeably with a low long-run elasticity.

CHAPTER V

THE DEMAND FOR MONEY IN SAUDI ARABIA

INTRODUCTION

Most economists and policy-makers agree that well-fitting and stable demand for money function is important and necessary for analysing the aggregate economic activity and for stabilization policy issues. Laidler (1985) indicated that the policy-maker required such a money demand function to make accurate predictions about the effects of the changes in money supply or government expenditure on variables such as interest rate, real income, prices and aggregate demand components. In the absence of such a function, it would be impossible to predict accurately the effects of changes in money supply and government expenditure on these variables. Darrat (1981) also pointed out that a well-behaved and stable money demand function is a necessary condition for building and estimating a reliable econometrics model of the monetarist approach to inflation. He illustrated his argument as follows. "Consider the familiar Fisherian equation of exchange:

$$MV = PY \ldots \text{(1)}$$

Where M is the stock of money, V is its velocity, P is the price level and finally Y is real income. The Modern Quantity Theory of Money, as expounded by Friedman's (1956) restatement, postulates that V, or its inverse, the ratio of the demand for real money balances to real income, is a stable function of a few variables, such as real income, Y, and some measure(s) of the opportunity cost of holding money, C. Hence, the demand for real money balances ratio, V^{-1}, can be expressed simply as the following non-linear function:

$$V^{-1} = Y^a C^b \ \dots \ (2)$$

Where a and b are some constants. From (1) we have

$$\frac{M}{P} = \frac{Y}{V} = YV^{-1} \ \dots \ (1)$$

Substituting (2) in (1) yields

$$\frac{M}{P} = YV^{-1} = Y^{1+a} C^b \ \dots \ (3)$$

Equation (3) represents the equilibrium condition in the money market between the supply of real balances $(\frac{M}{P})$ and the demand for them $(Y^{1+a} C^b)$. Solving equation (3) for P, and taking the percentage rate of change (denoted by a dot over the respective variable), we get:

$$\dot{P} = \dot{M} - (1+a)\dot{Y} - b\dot{C} \ \dots \ (4)$$

This last equation, which has been derived from a standard demand for money function, forms the basic foundation of the monetarist approach to inflation. In essence, equation (4) implies that if the growth rate of the actual nominal money stock, $\dot{M}$, exceeds that of the desired real money stock $[(1+a)Y + bC]$, the result would directly or indirectly be to induce the public to spend in excess of income, leading to rising prices (i.e. inflation) until equality is again reached between the actual growth of real money balances held $(\dot{M}-\dot{P})$ and its desired growth $[(1+a)\dot{Y} + b\dot{C}]$.

This discussion indicated that a well-behaved and stable demand for money function is a necessary condition for formulating and estimating a reliable model of the monetarist approach to inflation. In brief, most economists agree that the overall stability of the estimated money demand relationship together with the ability of the monetary authorities to control effectively the stock of money, are prerequisites for successful formation and implementation of monetary policy and for adequately predicting key macroeconomic variables.

In this chapter, an attempt will be made to test empirically several issues related to specification of the money demand function in Saudi Arabia:

Firstly, should the real current income as a proxy for the volume of transactions in the economy or the expected real income (permanent income) as a proxy for the wealth variable, be used in a money demand function for the Saudi economy?

Secondly, does the openness of the Saudi economy influence the demand for money, i.e. do external factors such as foreign interest rates and exchange rates have a significant impact on the demand for money in Saudi Arabia?

Thirdly, do the domestic opportunity cost variables, the expected inflation and the Saudi Riyal market interest rate exert a significant effect on the demand for money?

Fourthly, is the money demand function stable over time or is there a structural shift in the function?

This chapter is divded into three sections:

In the first section, the specification of Saudi money demand function will be discussed. The second section includes an estimation of the proposed money demand function and an interpretation of the empirical results. In the third section the stability of the estimated (well-fitting) functions will be tested (i.e. the approximate constancy of the estimated function's coefficients will be tested). In section four the estimated functions will be simulated to test their performance and forecasting power.

5.1   SPECIFICATION OF A MONEY DEMAND FUNCTION FOR THE SAUDI ECONOMY

In the previous chapter we discused several alternative hypotheses in an attempt to explain theoretically and empirically the behaviour of the demand for money in countries with diverse economic characteristics.   An important conclusion to be derived from these hypotheses is that there seems to be wide agreement that a correctly specified aggregate money demand function should include provision for a budget constraint variable and measure(s) for the opportunity cost of holding money.

In this section an attempt is made to determine an appropriate money demand function for the Saudi economy taking into account some important characteristics of the economy, such as its openness.

5.1.1. The Scale Variable

A wideley debated issue among economists is whether the current income as a proxy for the volume of transaction in the economy or the permanent (expected) income as a proxy for the wealth concept that includes the value of physical and financial assets as well as the present value of future labour income, is an appropriate scale variable for formulating a money demand function.   Meltzer (1963) tested the importance of current income, permanent income, wealth (his basic wealth definition includes only the non-human measure, i.e. financial and physical assets) using the demand for M_1 and M_2 in the United States.

He found that the wealth variable is slightly superior to the permanent income variable and far more important than the current income in explaining the variation in the demand for M_1 and M_2. Heller (1965) estimated the demand equations for M_1 and M_2 in the United States using equations that included income and short-term interest rate, wealth and short-term interest rate or both income, wealth and short-term interest rate as explanatory variables. His empirical results showed that the coefficients of both GNP and wealth are statistically significant in all equations in which only one of these variables appear with interest rate. However, when both of these constraints are included in the same equation only one of them retains its signficance: GNP in the M_1 equation and wealth in the M_2 equation. In his study of the demand for money in the United States, Laidler (1980) tested the explanatory power of current income and permanent (expected) income and wealth variables (as a proxy for this variable, he used indirect measures of non-human wealth). He found that both wealth and permanent income explain more of the variation in the dependent variable (M_1 and M_2) than the current income. Moreover, he found that permanent income is marginally superior to the wealth variable. Goldfeld (1973) measured the importance of income, wealth and change in wealth in the demand for money (M_1 and M_2) of the United States. His findings showed that the income and the change in wealth were significant when they appear in the same equation. Moreover, the wealth variable was unimportant when it was used with income alone while the latter retained its significance when all three variables were included in the same equation. Goldfeld pointed out that current income is probably the most useful scale variable to employ in short-term money demand functions for the United States. Furthermore, Chow (1966) and many other economists, such as Goldfeld (1973) and Laidler (1985), argued that current income may be related to the demand

for money through short-run functions more than the wealth variable and permanent income. Laidler (1985) indicated in his extensive review of the theoretical and empirical literature of the demand for money that the available empirical evidence from quarterly estimated models support permanent real income over current real income. Moreover, many researchers, such as Adekunle (1968), Bought (1979), Crockett (1980), etc. continue to use the transaction approach which focuses on income as the primary scale variable in formulating a money demand function.

In sum, it seems that this dispute can only be solved empirically. Many economists have suggested that for pragmatic policy purposes, one may wish to choose the measure of scale variable that performs best when the criterion chosen is accurate forecasting. Be that as it may, I shall experiment with both current and expected income, letting the empirical results determine our actual choice for Saudi Arabia.

An important choice facing researchers when selecting an appropriate proxy measure for the transaction motive of holding money in Saudi Arabia is the use of either GDP or non-oil GDP. In his survey of the Saudi economy, Knauer (1975) states that 'no reasonable relationship exists between the money supply and such income measures as the gross domestic product. This is not at all surprising given that a large fraction of the GDP is in the form of oil exports. Decisions on the volume of oil that is produced and on its price neither affect nor are affected by monetary creation, and there is no direct effect on the liquidity of the private sector. The oil sector should therefore be disregarded when one constructs a time series of income that is considered as influencing the demand for money.' Obviously, this issue

would become less significant if the oil sector was a stable part of the GDP. But the rapid change in oil export revenue in the last decades makes any estimates of the demand for money on the GDP as a scale variable unsatisfactory. Moreover, as El-Masri (1982) pointed out, since the oil revenue accrues directly to the government and a significant part of it finds its way to the accumulation of reserves and the non-oil GDP is indirectly influenced by government oil revenue through mainly government expenditure, GDP is probably not the most relevant current income variable to be used in estimating private transactions demand for money in Saudi Arabia. Non-oil GDP then appears to be the more appropriate scale variable. Metwally and Abdel Rahman (1987) also agree that non-oil GDP is a more appropriate proxy measure for the transaction demand for money in Saudi Arabia than GDP. This is because the oil sector's contribution to labour force is very low, the oil revenue goes directly to the government and, finally, a good proportion of it finds its way into the reserves. Also the oil sector's income has fluctuated sharply, especially during the last fifteen years. Other researchers, such as Chatah (1983) and Al-Saati (1986) agree that the non-oil GDP is a better proxy measure for the transaction motive of holding money in Saudi Arabia than GDP. It seems that there is wide agreement among researchers that the non-oil GDP represents the most suitable proxy measure for transaction demand for money in Saudi Arabia (see El-Masri 1982, Chatah 1983, Al-Saati 1986 and Metwally and Abdel Rahman 1987). Therefore, in this study the real non-oil GDP will be used as a scale variable in estimating the money demand relationship and to generate the expected real income for Saudi Arabia.

5.1.2   THE DOMESTIC OPPORTUNITY COST VARIABLES

The role of expected inflation in the demand for money, especially in the developed countries, is a controversial issue. Many economists in the developed countries agree that the expected inflation is part of the interest rate and that therefore its impact may simply be a reflection of the effect of the latter (the interest rate). On the other hand, other economists believe that the variations in nominal interest rates do not fully reflect the variations in expected rate of inflation. This means that there is still room for the expected inflation to play a direct role in the demand-for-money-function over and above that played by nominal interest rates in developed countries. Furthermore, a large body of empirical evidence indicates that in periods of rapid changes in the price level, inflation does influence the demand for money in these countries. Melitz (1976), in his study of the demand for money in France, found that the expected inflation rate is more important than the market interest rate. Moreover, in the empirical studies of the demand for money in the major ODCs (Canada, France, Germany Italy, Japan, the United Kingdom and the United States), conducted by Bought (1979) and Blundell-Wignall, Rondoni and Ziegelschmidt (1984), the expected rate of inflation was found to be significant with right sign in most of these countries.

So much for the role of expected inflation in the developed countries. Let us now turn to the role of expected inflation in the developing countries other than Saudi Arabia. It is most likely that the expected inflation has a significant impact on the demand for money in these countries. This may be attributed to several reasons:

Firstly, the financial markets outside the commercial banks are very rudimentary. As a result, there are very few financial assets. This implies that the financial assets represent a very small proportion of the people's portfolios whereas the physical assets represent a very large proportion. This in turn means that there is a very limited degree of substitution between financial assets and money balances. One would therefore, anticipate that the expected inflation as a measure of the physical assets' yields would have an important role in explaining the variation of the demand for money in these countries.

Secondly, many less-developed countries have experienced drastic changes in price levels. Moreover, the monetary authority in these countries has been unsuccessful in controlling inflation. One would therefore expect that under these circumstances the people's apprehension about the impact of inflation would play an important part in determining the demand for money.

Thirdly, as previously mentioned, the high degree of risk and uncertainty resulting from the economic, political and social problems and the imperfection of knowledge and markets in less-developed countries, lead us to believe that expected income and expected inflation would play an important role in the demand for money.

In the light of the above one would expect that the motive of holding physical assets may play an important role in determining the demand for money in these countries.

In many empirical studies on the demand for money in less-

developed countries (see, for example, Adekunle 1968, Diz 1970, Fan, and Liu, 1971, Wong, 1977, Darrat 1984), the expected rate of inflation is found to be significant and in some cases highly significant. This implies that the people in these countries adjust their demand for money according to their expectation of inflation. With regard to the impact of expected inflation on the demand for money in Saudi Arabia, many researchers such as El-Masri 1982, Chatah 1983, Darrat 1981, 1984 and 1986, Nagad 1985, Al-Saati 1986, all come to the conclusion that variations in the expected inflation influence the demand for money in Saudi Arabia. This implies that the Saudi are sensitive to inflation and, consequently, they view physical assets as an attractive alternative to monetary assets.

The Riyal interest rate (domestic market interest rate) is another domestic opportunity cost of holding money and should be taken into account in formulating a money demand function for Saudi Arabia. So far it has not been used in empirical researches related or unrelated to the demand for money in Saudi Arabia. This may be due to several reasons, such as:

Firstly, many researchers postulate that data on the Riyal interest rate are unavailable (for example, see El Mallakh 1982, Darrat 1981, 1986, and Chatah 1983), and even if available they would neither cover a sufficient period of time, nor exhibit sufficient variation over time to detect empirically a systematic relationship between money demand and interest rate.

Secondly, there has been a strong belief among researchers that since the Saudi society is an Islamic one, the Riyal interest rate may have an insignificant influence on the demand for money in Saudi Arabia

(according to Islamic teaching, interest on any type of loan or deposits, on whatever value is prohibited). However, for several reasons, we believe that the Saudi Riyal interest rate may in fact have a significant influence on the demand for money in Saudi Arabia:

Firstly, as previously mentioned, although interest on any type of loan or deposits and for whatever value is prohibited by Islamic teaching in Saudi Arabia, there are several indications that the interest-based transaction exists in Saudi Arabia:

(a)   The commercial banks and other economic agents are not legally forbidden to engage in interest-based activities;

(b)   In an attempt to increase control over domestic liquidity and the Riyal market interest rate, the Saudi monetary authority has recently launched two monetary policy tools: the Banking Security Deposit Account and Treasury Bonds. Apparently these both bear interest.

Secondly, figure (5.1) gives data on the three-months interest rates of the Saudi Riyal and U.S. Dollar. As can be seen, the Saudi Riyal interest rate exhibits significant variations. Moreover, it shows that when there are no disturbances in the Riyal money market (such as speculative transactions in the Riyal resulting from predicting the movements in Dollar/Riyal rate by investors inside and outside Saudi Arabia, changes in commercial banks' loan rollover, changes in government funds and changes in government deposits with commercial banks), the Riyal interest rate moves closely with that of the U.S. Dollar.

Thirdly, table (5.1) show that time and saving deposits and foreign currency deposits (mainly in U.S. Dollars) in Saudi Arabia have experienced high growth rate, especially during the period 1979 to 1982

when the Riyal and the U.S. Dollar rates registered their 'highest levels'. This indicates that the Saudis respond positively to the changes in Dollar and Riyal interest rates.

The following regression equations represent the relationship between two important components of Saudi money supply - demand deposits and time and saving deposits - and their determinants measure in real terms:

$$lnDD=0.58695+0.23571lnY-0.57580P^e-0.0463221lnDr-0.156171lnEx+0.762191lnDD_{t-1}$$

$$\quad(1.45)\quad(3.27)\quad(2.50)\quad(3.03)\quad(1.75)\quad(10.58)$$

$$R^2=0.994621\quad F=1753\quad D-h=0.393\quad SEE=0.0346$$

$$lnTD=1.6923+0.388121lnY+0.0752251lnDr+0.821571lnTD_{t-1}$$

$$\quad(3.24)\quad(4.23)\quad(2.70)\quad(22.70)$$

$$R^2=0.99603\quad F=3604\quad D-h=0.965\quad SEE=0.0725$$

Where:

DD is the real demand deposits

TD is the real time and saving deposits

Dr is the Riyal short-term market interest rate

Y is the real income (non-oil GDP)

P^e is the expected rate of inflation measure using ARIMA model (for more details, see the next section)

EX is the expected exchange rate of Riyal to U.S. Dollar measure using ARIMA model (for more details see the next section)

DD_{t-1} and TD_{t-1} are the lagged dependent variables of the real demand deposits and saving and time deposits respectively.

Notes:

(1) The numbers in parenthesis below the coefficient estimates are the absolute values of the t-ratios

(2) In our estimation of the equations above, quarterly data from 1976:1 to 1986:4 is used

(3) The Consumer Price Index (1980 = 100) is used as a deflator

Our empirical findings indicate that all the explanatory variables' coefficients in the above estimated equations have the right signs. Moreover, they are statistically significant at the 5 per cent level, except that expected exchange rate of Riyal to U.S. Dollar is statistically significant at the 10 per cent level. As the estimated equations show, the Riyal short-term market interest rate is statistically significant at the 5 per cent level *with long-run* elasticities -0.20 and -0.42 respectively. This supports *our argument that the* Saudi Riyal interest rate plays an important role in determining the demand for money in Saudi Arabia.

In the next section we will examine empirically the impact of the expected rate of inflation and Riyal short-term market interest rate as opportunity cost of holding domestic physical and financial assets respectively.

5.1.3   The External Variables

Given that the Saudi economy is very open with negligible restrictions on the movement of commodities and funds, and that there are very few domestic financial assets, one would expect that the external monetary and financial factors, such as foreign interest rates particularly the U.S. Dollar market interest rate and the expected movements of the Riyal exchange rate especially against the U.S. Dollar, would have a significant and negative influence on the demand for and the supply of domestic money balance. Hence, these factors should be taken into account in formulating a money demand function for the Saudi economy. In most previous empirical studies on the demand for

money in Saudi Arabia, the foreign interest rate, especially the U.S. Dollar market interest rate, was the only external factor to be tested (see, for example, El-Masri 1982, Chatah 1983, Darrat 1984 and 1985, Nagadi 1985, Pressly 1985 and Metwally and Abdel Rahman 1987). However, in this study the impact of both the foreign interest rate and the expected movement of the Saudi Riyal to the U.S. Dollar will be tested, i.e., an attempt will be made to test the hypothesis that an increase in the U.S. Dollar interest rate would induce Saudis to increase their holdings of foreign assets. This increase in foreign asset holdings would be financed by drawing down domestic money holdings. Hence, we may assume that the U.S. Dollar interest rate may exert a negative impact on the Saudi money demand. The other hypothesis which will be tested is that an expected change in the exchange rate of the Riyal against the U.S. Dollar may affect portfolio decisions concerning the degree of substitution between domestic and foreign holdings of financial assets. If, for example, the Saudi Riyal is expected to depreciate against the U.S. Dollar (i.e. the exchange rate increases), domestic portfolio holders would be induced to adjust their portfolios in favour of foreign assets. Hence it can be postulated that the expectation of exchange rate depreciation would have a negative influence on domestic money holdings in Saudi Arabia.

5.1.4. The Definition of Money

There is no general agreement among economists as to how best to define money, or which money definition is appropriate as a monetary target for conducting a successful monetary policy and empirical work. This may be attributed to several reasons:

Firstly, different theories emphasise different attributes of money. Darrat (1981) pointed out that theories, based on the transactions motive for holding money, include only those liquid assets which are generally accepted as the means of exchange in a certain economy. Other theories which emphasise the asset motive for holding money base their definitions of money on the returns (pecuniary and otherwise) from different kinds of assets.

Secondly, the lack of agreement on an appropriate definition of money may be due to the fact that what constitutes money tends to change in response to the evolution of a financial system, and that there is wide disagreement as to what distinguishes money from other assets. The difficulty in making such a distinction may be attributed to the differences in the returns paid on different types of financial assets and the maturies of these assets.

Thirdly, the difficulty of not having a universal definition of money emerges because different countries have differences in laws, mores, institutions, and other aspects of their societies which make their respective definitions of money quite diverse. Consequently, there has been a general consensus among economists that the issue of the appropriate definition can only be solved empirically. Under the empirical solution, the focus should be on the stability and predictive power of the model's statistical criteria for selecting an appropriate money definition.

In the absence of diverse financial assets in Saudi Arabia, the empirical choice in defining money is accordingly simplified to four monetary aggregates. These are: currency in the hands of the non-bank public (M_0); M_0 plus demand deposits of the public at commercial banks (M_1); M_1 plus time and savings deposits of the public at commercial banks (M_2); and M_2 plus other quasi-monetary deposits which include

deposits for letters of credit, deposits for letters of guarantee and resident foreign deposits, which are mainly in U.S. Dollars (M_3).

In choosing a proper definition to represent money in Saudi Arabia, the following points should be taken into consideration:

Firstly, in financially well-developed countries such as the United States and the United Kingdom, it seems artificial to distinguish between currency and private demand deposits since both are very close substitutes for transaction purposes. On the other hand in Saudi Arabia, as in other developing countries where the financial system is undeveloped, most transactions are carried out with currency. These transactions include virtually all salary payments and household spending. Hence, a well-founded distinction between currency and demand deposits can be made.

Secondly, since 1973, the Riyal time and saving deposits and quasi-monetary deposits, which include deposits for letters of credit, deposits for letters of guarantee and residents' foreign deposits (the residents foreign deposits represent the major part of the quasi-monetary), have experienced remarkable growth reflecting the drastic increase in government expenditure, the high growth rates of non-oil GDP, and the high levels of Riyal and U.S. Dollar interest rates (see tables 3-7 and 5.1). Moreover, the percentage shares of the deposits in M_2 and M_3 have increased considerably (see table 3.10). All these indicators reflect the increasing importance of M_2 and M_3 as a monetary aggregate.

In the light of the above, we shall employ M_0, M_1, M_2 and M_2^a (M_2 + foreign currency deposits) in our empirical work as independent variables.

5.1.5 The Mathematical Form of the Money Demand Function

Economic theory provides no rationale as to the correct mathematical form of the money demand function. However, general consensus favour the log-linear form. Moreover, our review of literature has revealed that many empirical studies of the demand for money in countries with diverse economic characteristics have successfully used the log-linear form. This form is also convenient in that elasticities can be directly obtained from the estimated coefficients. In the case of Saudi Arabia, many reserachers (see for example, El-Masri 1982, Chatah 1283, Darrat 1984 and 1985 and Al-Saati 1986) have successfully used the log-linear form in estimating the demand for money. In the light of this we believe that a log-linear form is an empirically appropriate functional form for use in this study for estimating the money demand relationship in Saudi Arabia. However, this does not mean that other functional forms, such as linear form, will not be tested.

The single equation method will be used for estimating the demand for money in Saudi Arabia. This assumes that the Saudi money market is always in an equilibrium condition, and that the factors which affect the money demand function do not affect the money supply function.

A partial adjustment model (a dynamic adjustment model), a Koyck-type equation that uses a single lagged dependent variable, will be employed. This model will allow us to distinguish between short and long-run behaviour of the demand for money in Saudi Arabia. In order to formulate a demand -for-money-function with a partial instead of an

instantaneous adjustment mechanism, we postulate that desired real balances (m^*) depend on the explanatory variables specified in the previous section. This relationship is represented by the following equation:

$$lnm^*_t = B_o + B_1lny - B_2P^e - B_3lnr - B_4lnEx \quad .... \quad (5.1)$$

The explanatory variables' symbols of this equation (5.1) will be defined shortly. One way of expressing the partial adjustment process is to write:

$$(lnm_t - lnm_{t-1}) = \lambda(lnm^*_t - lnm_{t-1}), \quad o \leqslant \lambda \leqslant 1 \quad .... \quad (5.2)$$

Equation (5.2) specifies that the change in actual real money holding (m) will respond partially to the difference between the desired real stock of money and the actual real stock of money where λ is the adjustment coefficient. By substituting 5.1 for 5.2, we can derive a short-run money demand function.

Taking the above discussion into account, we may write the general form of our short-run money demand function for the Saudi economy as follows:

$$lnm = B_o + B_1lny - B_2P^e - B_3lnr - B_4lnEx + B_5lnm_{t-1} \quad ....(5.3)$$

Where:

m is the actual real demand for money

y is the real current income (real non-oil GDP)

P^e is the expected inflation defined as $ln(\dfrac{ECP_t}{ECP_{t-1}})$ where ECP_t is the expected consumer index

r is short-term interest rate. Riyal and U.S. Dollar short term market interest rates are used alternatively as proxy measures for holding domestic and foreign financial assets respectively.

Ex is the expected exchange rate of Saudi Riyal to U.S. Dollar. Finally, the consummer price index (1980=100) is used as a deflator.

5.2 THE ESTIMATION AND THE INTERPRETATION OF THE EMPIRICAL RESULTS

Before discussing in detail our empirical results, several comments and points regarding the specification and estimation of our proposed money demand function and the empirical result of our statistical experiment should be mentioned.

Firstly, a quarterly data that runs from 1976:1 to 1986:4 is employed for estimating the demand for money in Saudi Arabia. An important reason for selecting this period is to capture the effect of the following factors on the Saudi money demand relationship and its stability.

(1)   During the period of this study, the Saudi economy has experienced two very different stages. In the first stage (1973-1982), which represents the oil-boom years, all the major economic and monetary indicators, such as non-oil GDP, aggregate demand, gross capital formation, monetary aggregates, etc. experienced remarkable growth (see Tables 2.9, 2.10 and 3.7). However in the second stage from 1982 to the present these indicators have registered low growth rates.

(2)   Very high rates of inflation were recorded between 1973 and 1980. However, since 1981 inflation has fallen rapidly, registering very low rates and in some cases negative rates (see Table 2.7).

(3)   Between 1979 and 1982 the Riyal and U.S. Dollar market interest rates recorded considerably higher levels. However, since 1981 they have recorded noticeably lower levels (see Table 5.1).

Secondly, except for non-oil GDP which is only available annually, all of the data used in this empirical work are available on a quarterly basis. Hence, an interpolation technique is employed to generate non-oil GDP from the corresponding annual data. This technique has been used successfully by many researchers, such as Diz (1970), B. Aghevli, Mi Khan, P. Narvekar and B. Short (1979), Darrat, Ali (1981), El-Masri, Ismael (1982). This technique is formulated as follows:

$$q_1 = \frac{4Y_t}{4\,Q_1}\cdot Q_1$$

$$q_2 = \frac{4Y_t}{4\,Q_1}\cdot Q_2$$

$$q_3 = \frac{4Y_t}{4\,Q_1}\cdot Q_3$$

$$q_4 = \frac{4Y_t}{4\,Q_1}\cdot Q_4$$

Where:

y_t = non-oil GDP, at current year

q_i = the corresponding value for quarter i of year t

$$Q_1 = [y_{t-1} + \frac{7.5}{12}(y_t - y_{t-1})]$$

$$Q_2 = [y_{t-1} + \frac{10.5}{12}(y_t - y_{t-1})]$$

$$Q_3 = [y_{t-1} + \frac{1.5}{12}(y_{t+1} - y_t)]$$

$$Q_4 = [y_t + \frac{4.5}{12}(y_{t+1} - y_t)]$$

Apart from the non-oil GDP and U.S. Dollar three-months market interest rate which are obtained from SAMA Annual Report and CSO (Central Statistical Office) respectively, all other quarterly data employed in this empirical work is obtained from the monthly publication of the International Monetary Fund, International Financial Statistics

(IFS). An important point which should be mentioned is that in IFS, time and saving deposits are defined as quasi money (IFS, line 35) which include time and saving deposits in Riyal defined as quasi-monetary deposits (IFS, line 25a) and foreign currency deposits (IFS, line 25b). Moreover, according to IFS, M_1 plus quasi money gives a broader measure of money similar to that which is frequently called M_2.

Thirdly, ARIMA (Box-Jenkins) time series models, a statistical package available in Minitab (a statistical computing system) are used to generate the expected rate of inflation, the expected exchange rate of the Saudi Riyal against the U.S. Dollar and the expected real non-oil GDP. The expected rate of inflation is generated using $ARIMA(0\ 2\ 1)$ model (random walk model) with autregressive = 0, difference = 2 and moving average = 1. The expected exchange rate of the Saudi Riyal against the U.S. Dollar is generated using $ARIMA(0\ 1\ 1)$ model (random walk model) with autregressive = 0, difference = 1 and moving average = 1. Finally, the expected real income (expected real non-oil GDP) is generated using ARIMA model with autregressive = 0, difference = 2 and moving average = 1. The reason for using the ARIMA model with auto-regressive = 0 to generate the expected rate of inflation, expected exchange rate and expected income is because the autocorrelation function (ACF) of the time series data of the rate of inflation, exchange rate and real income, indicates that the residuals of the variables are independently and randomly distributed. This means that the co-variance between any two residuals of these variables must equal zero, i.e. $Cov(U_t, U_{t-1}) = 0$ (for details see Cryer 1986). Moreover, it is found that the inflation rate, exchange rate and real income have non-stationary time series data (i.e. the means of these variables change with time). Therefore, the ARIMA model with first difference is

used to stationarise the data of inflation rate and exchange rate. The ARIMA model with second difference is employed to stationarise the real income data (for more details see Cryer, 1986). Finally, the time series data of the inflation rate, exchange rate and real income are found to have MA(1) (ARIMA model with moving average equal to 1) series $Z_t = a_t - \theta a_{t-1}$ with $E(Z_t) = 0$, $var(Z_t) = \sigma_a^2(1+\theta^2)$ and $Cov(Z_t, Z_{t-1}) = -\theta \sigma_a^2$ where Z_t denotes the observed time series, a_t represents an unobserved white series, that is, a sequence of independent, identically distributed random variables ($-1 \leqslant \theta \leqslant 1$).

Fourth, we experimented with the real current non-oil GDP and expected real income (expected real non-oil GDP). The empirical results reveal that the real current non-oil GDP is noticeably superior to the expected real income in explaining the variations of the demand for real M_0, M_1, M_2 and M_2^a (see Tables 5.3 and 5.4). Therefore we will only analyze the empirical results obtained from the estimated equations with real current non-GDP.

Fifth, the coefficients of the lagged dependent variables of these estimated equations are highly significant (see Tables 5.3 and 5.5). This indicates that the adjustment of the actual demand for real M_0, M_1, M_2 and M_2^a to the desired level (equilibrium level) is not instantaneous in Saudi Arabia.

Sixth, the expected exchange rate of the Saudi Riyal against the U.S. Dollar is found to be statistically insignificant in almost all the estimated equations for real M_0, M_1, M_2 and M_2^a. Moreover, its exclusion from these equations has no significant effect on the overall goodness of fit of these equations. Moreover, in some cases the overall goodness of fit is improved as a result of the exchange rate variable's exclusion. There are several plausible explanations for this finding:

1. The insignificance of the Riyal exchange rate variable may be due to the multicollinearity which may exist between this variable and other explanatory variables of our proposed money demand function. According to the correlation matrix (see Table 5.2), there is a high degree of linear correlation between the Riyal exchange rate variable and the U.S. Dollar and Riyal short-term market interest rate and expected inflation (0.77, 0.65 and 0.64 respectively).

2. This finding may be due to the fact that during the period of this study, the exchange rate of the Riyal against the U.S. Dollar has experienced few changes. This implies that the data of Riyal exchange variable does not exhibit sufficient variation over time to detect empirically a systematic relationship between the demand for money and the Riyal exchange rate variable.

Seventh, the Saudi Riyal and the U.S. Dollar short-term (3 months) market interest rates are used in this study to represent the opportunity cost of holding domestic and foreign assets respectively. Furthermore, there is a very high degree of linear correlation between the Riyal and U.S. Dollar interest rates (around 0.76). Therefore, these variables cannot be used simultaneously in a money demand function.

For the reasons stated in the previous section, the Riyal interest rate has never been used before in any empirical work related or unrelated to the demand for money. However, as we will show later in this section, the empirical results of the Riyal interest rate with respect to the demand for real M_1, M_2 and M_2^a are very encouraging. In addition, the Riyal interest rate's statistical significance and the

TABLE 5.1

The Growth Rates of Time and Saving, Foreign, and other Quasi-
Monetary Deposits and US and Riyal Short-Term Interest Rates

Year	TSD	FD	OQMD	Fr	Dr
1976	2.10	25.2	80.2	5.58	4.66
1977	15.20	32.42	30.1	6.36	4.50
1978	69.00	32.25	22.1	9.31	4.90
1979	36.1	54.20	27.9	12.16	8.28
1980	17.92	107.88	11.6	15.16	13.56
1981	71.90	66.9	46.1	16.10	13.13
1982	31.40	69.61	50.2	13.02	11.92
1983	10.2	16.63	11.0	9.72	9.70
1984	15.6	60.97	31.4	10.73	10.30
1985	9.0	12.91	21.4	8.23	8.34
1986	8.5	12.24	-5.8	6.71	8.17

Key to Abbreviations

TSD = Time and Saving Deposits;

FD   = Foreign Currency Deposits;

OQMD = Other Quasi-Monetary Deposits;

Fr   = US Dollar short-term market interest rate;

Dr   = Riyal short-term market interest rate.

Source:

[1] SAMA, Annual Report, different issues, 1974-1985.
[2] CSO (Central Statistical Office U.K.), different issues.
[3] Dr is unpublished data obtained from SAMA.

TABLE 5.2

The Correlation Matrix of the Proposed Money Demand
Functions' Explanatory Variables

	Y	p^e	Dr	Fr	Ex
Y	–	-0.61	0.64	0.37	-0.40
p^e	-0.61	–	-0.19	-0.20	0.64
Dr	0.64	-0.19	–	0.76	-0.65
Fr	0.37	-0.20	0.76	–	-0.77
Ex	-0.40	0.64	0.65	0.77	–

Key to Abbreviations:

Y = real income (non-oil GDP);

p^e = expected inflation;

Dr = the Saudi Riyal short-term interest rate;

Fr = the US Dollar short-term interest rate;

Ex = the expected exchange rate of Saudi Riyal
     against the US Dollar.

Note:

This matrix is obtained using TSP (Time-Series Computer Programme).

Figure 5.1 US & Riyal Interest Rate

REP   - - - - US Interest Rate   ------ Riyal Interest R
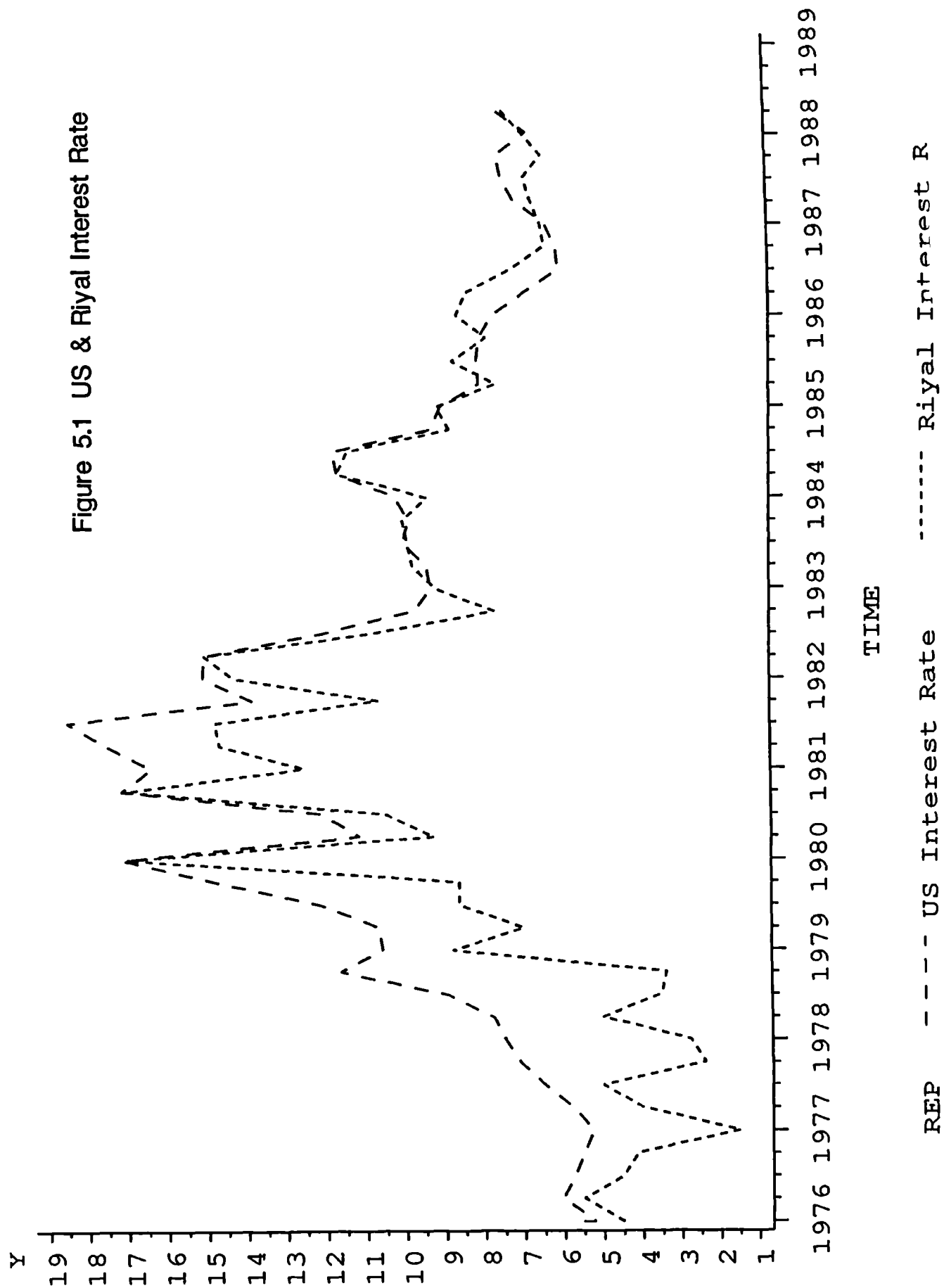
long-run elasticities of the estimated demand equations for real M_1, M_2 and $M_2{}^a$ are noticeably higher than the U.S. Dollar interest rate's statistical significance and long-run elasticities of the estimated demand equations for real M_1, M_2 and $M_2{}^a$ (see Tables 5.3 and 5.5).

Let us now analyze the empirical results of the estimated demand equations for M_0, M_1, M_2 and $M_2{}^a$ which are shown in Table 5.3. We will begin by analyzing the results of the estimated demand equations for M_0 (currency in the hand of the non-bank public).

Firstly, in all the estimated demand equations for M_0, the Real Current income (real non-oil GDP) is found to be statistically significant (at the 5 per cent level) with long-run elasticities less than unity ranging from 0.718 to 0.75 (see Tables 5.3 and 5.5). One explanation for the low long-run elasticities is perhaps that the non-oil GDP has experienced very low growth rates especially after 1980 (see Table 2.10). As a result of this, economic activities have declined noticeably. This should lead to a decrease in the transaction demand for money. However, the magnitudes of these long-run elasticities are in a meaningful range and close to the results obtained from similar empirical studies on the demand for currency in Saudi Arabia and other developing countries (see, for example, Adekunle 1968, Crokett and Evans 1980, El-Masri 1982 and Darrat 1984 and 1986).

Secondly, the expected inflation is found to exert, as predicted, a negative and significant influence on the demand for real M_0 In all the estimated demand equations for real M_0, the expected rate of inflation is found to be significant (at the 5 per cent level) with very high long-run elasticities (see Tables 5.3 and 5.5). This suggests that the Saudis are very sensitive to inflation and, consequently, they view real physical assets as an attractive alternative to monetary assets.

Thirdly, the Riyal and US Dollar short-term market interest rates are found to be statistically insignificant with a negligible influence on the demand for real M_0 (see Tables 5.3 and 5.5). This result is to be expected since the Saudis hold real cash balances only for transaction purposes.

Fourthly, the adjustment coefficient of the estimated demand equations for real M_0 are relatively low, ranging from 0.331 to 0.339 (see Table 5.5). This indicates that there is a relatively long period of adjustment between the actual real demand for M_0 and the desired level (equilibrium level).

Finally, the estimated equation [1.5] appears to be very satisfactory and consistent with the theory and the findings of many empirical studies on the demand for M_0 in developed and less-developed countries and Saudi Arabia (see for example Crockett and Evans 1980 and Darrat 1985 and 1986). The overall fit of this equation is excellent with two explanatory variables jointly explaining a very large proportion of the variations in M_0 (it has the highest $\bar{R}^2$ among the estimated demand equations for M_0). Moreover, as shown in Figure 5.2, this equation traces the actual data point of real M_0 fairly closely. Therefore, equation 1.5 represents the final form of the demand for real M_0 in Saudi Arabia.

As far as the empirical results of the demand for M_1 (M_0 + demand deposits of the public at the commercial bank) are concerned, the estimated demand equations for real M_1 reveal the following empirical findings.

Firstly, in all the estimated demand equations for M_1, the Real Current income (real non-oil GDP) is found to be significant (at the 5 per cent level) with long-run elasticities less than unity (see Tables

5.3 and 5.5). These elasticities are very close to the corresponding long-run elasticities of the estimated demand equations for M_0. Again, the magnitudes of these long-run elasticities are in a meaningful range and close to the result obtained from many empirical studies of the demand for money in developing countries and Saudi Arabia (see, for example, Crockett and Evans 1980, Chatah 1983, Darrat 1984, 1985 and 1986 and Al-Saati 1986).

Secondly, as predicted, the expected inflation is found to be statistically significant (at the 5 per cent level) in all the estimated demand equations for M_1. Its long-run elasticities are noticeably high (see Tables 5.3 and 5.5). Again this finding suggests that the Saudis react strongly to changes in price level by altering their investment portfolios. Moreover, the expected inflation's long-run elasticities of the estimated demand equations for real M_1 are slightly lower than the corresponding long-run elasticities of the estimated demand equations for real M_0. In sum, the signficance and the high long-run elasticities of the expected inflation with respect to the demand for real M_0 and M_1 indicate that the expected inflation plays an important part in determining the demand for real M_0 and M_1 in Saudi Arabia.

Thirdly, the US Dollar short-term market interest rate is found to be insignificant with negligible influence on the demand for real M_1 (see Tables 5.3 and 5.5). This finding may be attributed to the fact that in a normal situation, where there are no disturbances in the Riyal market (such as speculative transactions in the Riyal against the US Dollar, changes in commercial loan rollover, changes in government funds and changes in government deposits at the commercial banks), the Riyal market interest rate moves close to and in the same direction as the US Dollar market interest rate. This implies that the two interest rates are highly and positively correlated (the correlation matrix indicates

that the degree of correlation between the two currencies' interest rate is around +0.78 (see Table 5.2). For this reason, the Riyal interest rate can be regarded as an appropriate substitute for the US Dollar interest rate. Consequently, Saudis have found that the Riyal time deposits are an appropriate and attractive alternative financial investment to the US Dollar time deposits and other forms of fixed yield foreign financial investment (the Saudis' foreign financial investment in fixed yield financial assets are mainly in US Dollars).

Fourth, as we epxected, the Riyal interest rate is found to be significant (at the 5 per cent level) with relatively low long-run elasticities (see Tables 5.3 and 5.5). There are three plausible explanations for this:

(1)   It seems that there has been a change in Saudi Arabia's attitude toward acceptance of interest payments.

(2)   Since 1981, there has been a noticeable decline in economic activities, reflecting the sharp decrease in government expenditure. This has led to a considerable fall in private real investment. In addition, investment opportunities in the financial markets have become very limited (mainly, time and saving deposits and shares). These factors taken together make the Riyal time deposits a very attactive domestic financial investment.

(3)   During the period of this study, the Riyal interest rate has recorded high levels which make the Riyal time deposits an appropriate domestic financial investment.

In brief, this finding confirms our hypothesis that the Riyal interest rate plays an important role in determining the demand for real M_1.

Fifth, the adjustment coefficients of the estimated demand equations for real M_1 are relatively low, ranging from 0.209 to 0.291.

This suggests that there is a relatively long period of adjustment between the actual real demand for M_1 and the desired level (equilibrium level). Moreover, the adjustment coefficients of the estimated demand equations for real M_1 are slightly lower than the corresponding adjustment coefficients of the estimated demand equations for M_0 (see Table 5.5).

Sixth, according to the statistical criteria of the estimated demand equations for real M_1, it appears that equation 2.3 is very appropriate to represent the final form of the demand for M_1. Its explanatory variables jointly explain a very large proportion of the variations in the dependent variable. This is reflected in a very high R^2 and F-test. Figure 5.3 shows that this equation traces the actual data points fairly closely. Moreover, this equation is consistent with the theory and findings of many empirical studies on the demand for money in developed and less-developed countries (see, for example, Adekunle 1968, Goldfeld 1973, Melitz 1976 and Bought 1979). It also supports our argument that the Riyal market interest rate plays an important role in determining the demand for M_1 (see Table 5.3). This equation also reflects the development of the Saudi money market and the change in Saudis' attitude towards acceptance of interest payment.

Regarding the empirical results of the demand for real M_2 (M_1 + time and savings deposits), the estimated demand equations for real M_2 reveal the following findings:

Firstly, the real current income (real non-oil GDP) is found to be statistically significant at the 5 per cent level with long-run elasticities around unity ranging from 0.986 to 1.139 (see Tables 5.3 and 5.5).

Secondly, again, the expected inflation is found to be statistically significant at the 5 per cent level in all the estimated

demand equations for real M_2. Its long-run elasticities are noticeably high, ranging from -1.086 to -1.635 (see Tables 5.3 to 5.5). However, these elasticities are lower than the corresponding long-run elasticities of the estimated demand equations of real M_0 and M_1. This result proves again that the Saudis are very sensitive to inflation and, consequently, they view real assets as an attractive alternative to monetary assets, i.e. inflation has a significant impact on the Saudis' investment portfolios.

Thirdly, the Saudi Riyal an U.S. Dollar short-term market interest rates are both found to exert, as predicted, a negative and statistically significant influence on the demand for real M_2. In all the estimated demand equations for real M_2, these variables are found to be statistically significant at the 5 per cent level with long-run elasticities significantly lower than unity. However, these elasticities are slightly higher than the corresponding long-run elasticities of the estimated demand for real M_1 (see Table 5.5). This indicates that Saudi Riyal and U.S. Dollar interest rates have a greater impact on the demand for real M_2 than on the demand for real M_1.

Fourth, again the adjustment coefficients of the estimated demand equations for real M_2 are relatively low which indicates that there is a relatively long period of adjustment between the actual and desired (equilibrium) level of the demand for real M_2. Furthermore, the adjustment coefficients of the estimated demand equations for real M_2 are similar to the corresponding adjustment coefficients of the estimated demand equations for real M_0 and M_1.

Finally, according to the statistical criteria of the estimated demand equation for real M_2, it seems that equation 3.2 represents a very appropriate estimated equation for explaining the variations in the demand for real M_2. Its explanatory variables jointly explain a very

large proportion of the variations in the dependent variable. This is reflected in a very high $\bar{R}^2$ and F-test. Figure 5.3 shows that this equation traces the actual data points fairly closely. Moreover, this equation is consistent with theory and empirical money results on the demand for M_2 in developed and less-developed countries (see for example Adekunle 1968, Goldfeld 1973, Khan 1974 and Bought 1979). It also confirms our hypothesis that the Riyal market interest rate exerts a significant and negative influence on the demand for real M_2. This reflects the change in the Saudi attitude towards acceptance of interest payment. Therefore, the equation represents the final form of the demand for real M_2 in Saudi Arabia.

The estimation of the demand for real $M_2{}^a$ (M_2 + foreign currency deposits) indicates that apart from the finding that *the expected* inflation is found to be statistically insignificant even at the 10 per cent level when it appears in the same equation with the Riyal interest rate (see Table 5.3), all other empirical findings of estimating the demand equation for real $M_2{}^a$ are similar to the empirical results obtained from estimating the demand equations for real M_2 (see Tables 5.3 and 5.5). Moreover, according to the statistical criteria of the estimated demand equations for real M_2 , it appears that equation 4.2 is very appropriate to represent the final form of the demand for M_1. The overall fit of this equation is excellent with three explanatory variables jointly explaining a very large proportion of the variation in $M_2{}^a$. Figure 5.5 shows that this equation traces the actual data points of real $M_2{}^a$ fairly closely.

TABLE 5.3

The Estimated Demand Equations for Real m_0, m_1, m_2 and $m_2{}^a$
[In these equations the Real Income is used as a Scale Variable]

Equation Number

1.1

$\ln m = 0.090386 + 0.25214 \ln y - 0.94360\, p^e - 0.0061117 \ln \bar{D}r - 0.22687E + 0.66273 \ln m_{t-1}$
$(0.39) \quad (2.19) \qquad (3.57) \qquad (0.35) \qquad\qquad (0.28) \qquad (5.64)$
$\bar{R}^2 = 0.988904; \; F = 767; \; D\text{-}h = -0.539; \; SEE = 0.043873$

1.2

$\ln m = 0.064057 + 0.25217 \ln y - 0.95863\, p^e - 0.011046 \ln \bar{F}r - 0.32636E + 0.66061 \ln m_{t-1}$
$(0.27) \quad (2.24) \qquad (3.76) \qquad (0.49) \qquad\qquad (0.40) \qquad (5.63)$
$\bar{R}^2 = 0.988937; \; F = 770; \; D\text{-}h = -0.119; \; SEE = 0.04380$

1.3

$\ln m = 0.082816 + 0.24770 \ln y - 0.95527\, p^e - 0.0061000 \ln Dr + 0.66480 \ln m_{t-1}$
$(0.31) \quad (2.20) \qquad (3.66) \qquad (0.34) \qquad (5.75)$
$\bar{R}^2 = 0.989158; \; F = 982; \; D\text{-}h = -0.205; \; SEE = 0.04337$

1.4

$\ln m = 0.095985 + 0.24689 \ln y - 0.98128\, p^e - 0.0093935 \ln Fr - 0.66237 \ln m_{t-1}$
$(0.43) \quad (2.23) \qquad (4.00) \qquad (0.42) \qquad (5.72)$
$\bar{R}^2 = 0.989177; \; F = 984; \; D\text{-}h = -0.270; \; SEE = 0.0433$

*1.5

$\ln m = 0.14517 + 0.23778 \ln y - 0.98503\, p^e + 0.66933 \ln m_{t-1}$
$(0.76) \quad (2.21) \qquad (4.05) \qquad (5.89)$
$\bar{R}^2 = 0.989399; \; F = 1339; \; D\text{-}h = -0.188; \; SEE = 0.0429$

TABLE 5.3 (Continued) .....

2.1a $\ln m_1 = 0.20672 + 0.21956 \ln y - 0.47856\, p^e - 0.041961 \ln Dr - 0.10015 \ln Ex + 0.72041 \ln m_{1t-1}$
  (0.58)   (2.61)   (2.15)   (2.93)   (1.21)   (8.03)
  $\bar{R}^2 = 0.994617$; $F = 1590$; $D\text{-}h = 1.041$; $SEE = 0.03070$

2.1b $\ln m_1 = 0.14741 + 0.23852 \ln y - 0.57680\, p^e - 0.032160 \ln Dr - 0.63737E + 0.69989 \ln m_{1t-1}$
  (0.95)   (2.70)   (2.82)   (2.53)   (1.08)   (7.50)
  $\bar{R}^2 = 0.994576$; $F = 1577$; $D\text{-}h = 1.352$; $SEE = 0.0308$

2.2a $\ln m_1 = 0.18740 + 0.15888 \ln y - 0.66455\, p^e - 0.023661 \ln Fr - 0.068302 \ln Ex + 0.75227 \ln m_{1t-1}$
  (0.37)   (2.00)   (2.70)   (0.85)   (0.53)   (7.40)
  $\bar{R}^2 = 0.993527$; $F = 1320$; $D\text{-}h = 0.561$; $SEE = 0.0337$

2.2b $\ln m_1 = 0.36737 + 0.20650 \ln y - 0.70150\, p^e - 0.015068 \ln Fr - 0.87074E + 0.70916 \ln m_{1t-1}$
  (2.67)   (2.18)   (3.31)   (0.88)   (1.37)   (7.00)
  $\bar{R}^2 = 0.993788$; $F = 1376$; $D\text{-}h = 1.00$; $SEE = 0.0307$

*2.3 $\ln m_1 = 0.18386 + 0.20867 \ln y - 0.58572\, p^e - 0.033630 \ln Dr - 0.72726 \ln m_{1t-1}$
  (1.21)   (2.48)   (2.86)   (2.66)   (8.08)
  $\bar{R}^2 = 0.994554$; $F = 1964$; $D\text{-}h = 1.05$; $SEE = 0.03088$

2.4 $\ln m_1 = 0.44846 + 0.16619 \ln y - 0.72774\, p^e - 0.011983 \ln Fr - 0.74306 \ln m_{1t-1}$
  (3.57)   (2.00)   (3.41)   (0.70)   (7.48)
  $\bar{R}^2 = 0.993647$; $F = 1682$; $D\text{-}h = 0.537$; $SEE = 0.0334$

TABLE 5.3 (Continued) .....

2.5 $\ln m_1 = 0.49727 + 0.17565 \ln y - 0.74531\ p^e + 0.72905 \ln m_{1_{t-1}}$
     (4.80)   (2.00)   (3.54)   (7.54)
     $\bar{R}^2 = 0.993729$; $F = 2272.49$; $D\text{-}h = 0.605$; $SEE = 0.0331$

2.6 $\ln m_1 = 0.43439 + 0.21491 \ln y - 0.72546\ p^e - 0.79835E + 0.69460 \ln m_{1_{t-1}}$
     (3.81)   (2.29)   (3.74)   (1.27)   (6.97)
     $\bar{R}^2 = 0.993823$; $F = 1730$; $D\text{-}h = 1.058$; $SEE = 0.03289$

2.7 $\ln m_1 = -0.63272 + 0.17807 \ln y - 0.055151 \ln Dr - 0.17132 \ln Ex + 0.79128 \ln m_{1_{t-1}}$
     (2.04)   (2.08)   (4.07)   (2.16)   (9.07)
     $\bar{R}^2 = 0.994116$; $F = 1817$; $D\text{-}h = 1.335$; $SEE = 0.0331$

3.1 $\ln m_2 = -0.29107 + 0.33839 \ln y - 0.49220\ p^e - 0.049763 \ln Fr - 0.48341E + 0.66472 \ln m_{2_{t-1}}$
     (1.19)   (2.98)   (2.84)   (2.46)   (0.86)   (6.96)
     $\bar{R}^2 = 0.996512$; $F = 2458$; $D\text{-}h = 1.618$; $SEE = 0.02973$

*3.2 $\ln m_2 = -0.40445 + 0.32434 \ln y - 0.32872\ p^e - 0.044314 \ln Dr + 0.69724 \ln m_{2_{t-1}}$
     (1.85)   (3.50)   (2.00)   (3.47)   (9.20)
     $\bar{R}^2 = 0.996985$; $F = 3555$; $D\text{-}h = 1.497$; $SEE = 0.02764$

3.3 $\ln m_2 = -0.21890 + 0.31735 \ln y - 0.52633\ p^e - 0.045597 \ln Fr + 0.67811 \ln m_{2_{t-1}}$
     (0.96)   (2.87)   (3.13)   (2.33)   (7.22)
     $\bar{R}^2 = 0.996536$; $F = 3093$; $D\text{-}h = 1.243$; $SEE = 0.02963$

TABLE 5.3 (Continued) .....

3.4
$$\ln m_2 = -0.62460 + 0.37547 \ln y - 0.053479 \ln Dr + 0.670393 \ln m_{2t-1}$$
$$(3.23) \quad (4.08) \quad\quad (4.36) \quad\quad\quad (8.70)$$
$$\bar{R}^2 = 0.996774; \; F = 4429; \; D\text{-}h = 1.849; \; SEE = 0.02859$$

4.1
$$\ln m_2^a = -0.30552 + 0.23678 \ln y - 0.40924 \, p^g - 0.053281 \ln Fr - 0.14307E + 0.77927 \ln m_2^a{}_{t-1}$$
$$(1.06) \quad (0.22) \quad\quad (2.28) \quad\quad (2.26) \quad\quad (0.25) \quad\quad (9.63)$$
$$\bar{R}^2 = 0.996940; \; F = 2804; \; D\text{-}h = 1.680; \; SEE = 0.0306$$

*4.2
$$\ln m_2^a = -0.29151 + 0.18769 \ln y - 0.26881 \, p^g - 0.037551 \ln Dr + 0.83400 \ln m_2^a{}_{t-1}$$
$$(1.17) \quad (2.25) \quad\quad (1.46) \quad\quad (2.67) \quad\quad (13.79)$$
$$\bar{R}^2 = 0.997139; \; F = 3747; \; D\text{-}h = 1.68; \; SEE = 0.029573$$

4.3
$$\ln m_2^a = -0.28755 + 0.23314 \ln y - 0.41957 \, p^g - 0.052239 \ln Fr + 0.78085 \ln m_2^a{}_{t-1}$$
$$(1.04) \quad (2.23) \quad\quad (2.43) \quad\quad (2.28) \quad\quad (9.79)$$
$$\bar{R}^2 = 0.997014; \; F = 3590; \; D\text{-}h = 1.57; \; SEE = 0.030211$$

4.4
$$\ln m_2^a = -0.496092 + 0.23464 \ln y - 0.045918 \ln Dr + 0.81054 \ln m_2^a{}_{t-1}$$
$$(2.38) \quad\quad (3.00) \quad\quad (3.53) \quad\quad (13.70)$$
$$\bar{R}^2 = 0.997058; \; F = 4858; \; D\text{-}h = 1.721; \; SEE = 0.0300$$

Key to Abbreviations:

m_0, m_1, m_2 and $m_2{}^a$ are the real money definitions defined as follows:

m_0 = the currency in the hands of the non-bank public

m_1 = m_0 + demand deposits of the public at the commercial banks

m_2 = m_1 + time and saving deposits

$m_2{}^a$ = m_2 + foreign currency deposits

y = the real expected income (non-oil GDP)

p^e = the expected rate of inflation defined as $\ln\left(\dfrac{ECP_t}{ECP_{t-1}}\right)$ [where ECP_t is the expected consumer price index]

D_r = the Saudi Riyal short-term market interest rate

F_r = the US Dollar short-term market interest rate

Ex = the expected exchange rate of the Saudi Riyal against the US Dollar

E = the rate of change in the expected exchange rate of the Saudi Riyal against the US Dollar defined as $\ln\left(\dfrac{EX_t}{EX_{t-1}}\right)$

Notes:

[1] The numbers in parenthesis below the coefficient estimates are the absolute values of the t-ratios. R^2 is the correlation coefficient adjusted for degrees of freedom. SEE is the standard error of the regression. D-h is the Durbin Statistic to test for first-order serial correlation when a lagged dependent variable appears among the regressors.

[2] (-) is placed on top of a symbol to indicate that the variable is being measured in nominal terms.

[3] TSP (Time-Series Computer Programme) is employed in estimating the above equations.

[4] The Ordinary Least Squares Method (OLSQ) is used to estimate the above equations.

[5] (*) is placed before some equation numbers to indicate that the equations are very appropriate to represent the final form of the demand for real m_0, m_1, m_2 and $m_2{}^a$.

[6] The Consumer Price Index (1980 = 100) is used as a deflator

TABLE 5.4

The Estimated Demand Equations for Real m_0, m_1, m_2 and m_2^a

[In these equations the Expected Income is used as a Scale Variable]

Equation
Number

1.1 ln m = 0.12772 + 0.22015 ln Ey - 0.95551 p^e - 0.0045806 ln Dr - 0.17172E + 0.69345 ln m_{t-1}
(0.47)   (1.95)   (3.52)   (0.25)   (0.21)   (5.96)
$\bar{R}^2$ = 0.988635; F = 749; D-h = -0.367; SEE = 0.0444

1.2 ln m = 0.11850 + 0.22265 ln Ey - 0.96843 p^e - 0.0096693 ln Fr - 0.25545E + 0.68993 ln m_{t-1}
(0.50)   (2.00)   (3.75)   (0.42)   (0.31)   (5.95)
$\bar{R}^2$ = 0.988669; F = 751; D-h = -0.408; SEE = 0.04433

1.3 ln m = 0.13453 + 0.21960 ln Ey - 0.96475 p^e - 0.0050144 ln Dr + 0.69270 ln m_{t-1}
(0.51)   (1.97)   (3.65)   (0.28)   (6.03)
$\bar{R}^2$ = 0.988914; F = 959; D-h = -0.447; SEE = 0.04385

1.4 ln m = 0.14164 + 0.21964 ln Ey - 0.98584 p^e - 0.0084188 ln Fr - 0.69016 ln m_{t-1}
(0.63)   (2.00)   (3.96)   (0.38)   (5.99)
$\bar{R}^2$ = 0.988932; F = 961; D-h = -0.512; SEE = 0.043817

1.5 ln m = 0.18529 + 0.21172 ln Ey - 0.98929 p^e + 0.69615 ln m_{t-1}
(0.98)   (1.99)   (4.02)   (6.17)
$\bar{R}^2$ = 0.98917; F = 1310; D-h = -0.429; SEE = 0.04330

TABLE 5.4 (Continued) .....

2.1a $\quad \ln m_1 = 0.17484 + 0.20030 \ln Ey - 0.46683\, p^e - 0.041136 \ln Dr - 0.095614 \ln Ex + 0.73992 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (0.49)\qquad (2.35)\qquad\quad (2.10)\qquad\quad\quad (2.83)\qquad\qquad (1.14)\qquad\qquad (8.14)$
$\qquad\quad \bar{R}^2 = 0.994461;\ F = 1545;\ \text{D-h} = 1.00;\ \text{SEE} = 0.03115$

2.1b $\quad \ln m_1 = 0.16805 + 0.21394 \ln Ey - 0.56039\, p^e - 0.031901 \ln Dr - 0.54181E + 0.72455 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (1.07)\qquad (2.41)\qquad\quad (2.70)\qquad\quad\quad (2.47)\qquad\qquad (0.91)\qquad\qquad (7.70)$
$\qquad\quad \bar{R}^2 = 0.994395;\ F = 1527;\ \text{D-h} = 1.240;\ \text{SEE} = 0.03133$

2.2a $\quad \ln m_1 = 0.38381 + 0.18159 \ln Ey - 0.68326\, p^e - 0.015355 \ln Fr - 0.78115E + 0.73465 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (2.77)\qquad (1.92)\qquad\quad (3.19)\qquad\quad\quad (0.88)\qquad\qquad (1.23)\qquad\qquad (7.22)$
$\qquad\quad \bar{R}^2 = 0.993624;\ F = 1341;\ \text{D-h} = 0.860;\ \text{SEE} = 0.0334$

2.2b $\quad \ln m_1 = 0.19270 + 0.14100 \ln Ey - 0.64642\, p^e - 0.024241 \ln Dr - 0.068702 \ln Ex + 0.77126 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (0.38)\qquad (1.50)\qquad\quad (2.61)\qquad\quad\quad (0.86)\qquad\qquad (0.53)\qquad\qquad (7.50)$
$\qquad\quad \bar{R}^2 = 0.993420;\ F = 1299;\ \text{D-h} = 0.457;\ \text{SEE} = 0.03395$

2.3 $\quad \ln m_1 = 0.19715 + 0.19118 \ln Ey - 0.57020\, p^e - 0.033213 \ln Dr + 0.74514 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (1.28)\qquad (2.24)\qquad\quad (2.75)\qquad\quad\quad (2.60)\qquad\qquad (8.18)$
$\qquad\quad \bar{R}^2 = 0.994419;\ F = 1916;\ \text{D-h} = 0.965;\ \text{SEE} = 0.03126$

2.4 $\quad \ln m_1 = 0.45508 + 0.14920 \ln Ey - 0.71059\, p^e - 0.012479 \ln Fr + 0.76106 \ln m_{1_{t-1}}$
$\qquad\qquad\quad (3.60)\qquad (1.63)\qquad\quad (3.32)\qquad\quad\quad (0.72)\qquad\qquad (7.60)$
$\qquad\quad \bar{R}^2 = 0.993541;\ F = 1654;\ \text{D-h} = 0.600;\ \text{SEE} = 0.0336$

TABLE 5.4 (Continued) .....

2.5 $\ln m_1 = 0.50606 + 0.15901 \ln Ey - 0.72870 \, p^e + 0.74651 \ln m_{1_{t-1}}$
           (4.86)   (1.77)   (3.44)   (7.67)
           $\bar{R}^2 = 0.993620$; $F = 2233$; $D\text{-}h = 0.513$; $SEE = 0.0331$

2.6 $\ln m_1 = 0.45227 + 0.19032 \ln Ey - 0.70777 \, p^e - 0.70584E + 0.71961 \ln m_{1_{t-1}}$
           (3.96)   (2.03)   (3.34)   (1.12)   (7.20)
           $\bar{R}^2 = 0.993661$; $F = 1686$; $D\text{-}h = 0.915$; $SEE = 0.03332$

2.7 $\ln m_1 = 0.59341 + 0.16013 \ln Ey - 0.054066 \ln Dr - 0.16561 \ln Ex + 0.80885 \ln m_{1_{t-1}}$
           (1.91)   (1.86)   (3.96)   (2.07)   (9.19)
           $\bar{R}^2 = 0.994461$; $F = 1545$; $D\text{-}h = 1.00$; $SEE = 0.03243$

3.1 $\ln m_2 = -0.19784 + 0.29452 \ln Ey - 0.50079 \, p^e - 0.044316 \ln Fr - 0.37406E + 0.70026 \ln m_{2_{t-1}}$
           (0.81)   (2.57)   (2.82)   (2.16)   (0.65)   (7.26)
           $\bar{R}^2 = 0.996339$; $F = 2341$; $D\text{-}h = 1.293$; $SEE = 0.030459$

3.2 $\ln m_2 = -0.33984 + 0.29448 \ln Ey - 0.33859 \, p^e - 0.042040 \ln Dr + 0.72086 \ln m_{2_{t-1}}$
           (1.54)   (3.13)   (1.96)   (3.22)   (9.35)
           $\bar{R}^2 = 0.996834$; $F = 3585.49$; $D\text{-}h = 1.397$; $SEE = 0.028326$

3.3 $\ln m_2 = -0.14877 + 0.28176 \ln Ey - 0.52687 \, p^e - 0.041502 \ln Fr + 0.70769 \ln m_{2_{t-1}}$
           (0.65)   (2.52)   (3.07)   (2.08)   (7.44)
           $\bar{R}^2 = 0.996393$; $F = 2970$; $D\text{-}h = 1.011$; $SEE = 0.030236$

TABLE 5.4 (Continued) .....

3.4 $\ln m_2 = -0.56693 + 0.3478 \ln Ey - 0.051509 \ln Dr + 0.69309 \ln m_{2_{t-1}}$
                    (2.90)   (3.73)   (4.11)   (8.84)
         $\bar{R}^2 = 0.996610; \; F = 4214; \; D\text{-}h = 1.810; \; SEE = 0.0293112$

4.1 $\ln m_2{}^a = -0.23188 + 0.20979 \ln Ey - 0.41862 \, p^e - 0.048653 \ln Fr - 0.079073E + 0.79891 \ln m_2{}^a{}_{t-1}$
                    (0.82)   (1.99)   (2.30)   (2.1)   (0.41)   (9.98)
         $\bar{R}^2 = 0.996872; \; F = 2741; \; D\text{-}h = 1.56; \; SEE = 0.03092$

4.2 $\ln m_2{}^a = -0.24748 + 0.17191 \ln Ey - 0.27852 \, p^e - 0.035954 \ln Dr + 0.84502 \ln m_2{}^a{}_{t-1}$
                    (1.00)   (2.08)   (1.50)   (2.55)   (14.00)
         $\bar{R}^2 = 0.997089; \; F = 3683; \; D\text{-}h = 1.68; \; SEE = 0.02983$

4.3 $\ln m_2{}^a = -0.22358 + 0.20842 \ln Ey - 0.42413 \, p^e - 0.048184 \ln Fr + 0.79930 \ln m_2{}^a{}_{t-1}$
                    (0.82)   (2.00)   (2.42)   (2.10)   (10.11)
         $\bar{R}^2 = 0.996951; \; F = 3515; \; D\text{-}h = 1.49; \; SEE = 0.03053$

Key to Abbreviations:

m_0, m_1, m_2 and m_2^a are the real money definitions defined as follows:

m_0 = the currency in the hands of the non-bank public

$m_1 = m_0$ + demand deposits of the public at the commercial banks

$m_2 = m_1$ + time and saving deposits

$m_2^a = m_2$ + foreign currency deposits

Ey = the expected real income (non-oil GDP)

p^e = the expected rate of inflation defined as $\ln\left(\dfrac{ECP_t}{ECP_{t-1}}\right)$ [where ECP_t is the expected consumer price index]

D_r = the Saudi Riyal short-term market interest rate

F_r = the US Dollar short-term market interest rate

Ex = the expected exchange rate of the Saudi Riyal against the US Dollar

E = the rate of change in the expected exchange rate of the Saudi Riyal against the US Dollar defined as $\ln\left(\dfrac{EX_t}{EX_{t-1}}\right)$

Notes:

[1] The numbers in parenthesis below the coefficient estimates are the absolute values of the t-ratios. R^2 is the correlation coefficient adjusted for degrees of freedom. SEE is the standard error of the regression. D-h is the Durbin Statistic to test for first-order serial correlation when a lagged dependent variable appears among the regressors.

[2] (-) is placed on top of a symbol to indicate that the variable is being measured in nominal terms.

[3] TSP (Time-Series Computer Programme) is employed in estimating the above equations.

[4] The Ordinary Least Squares Method (OLSQ) is used to estimate the above equations.

[5] The Consumer Price Index (1980 = 100) is used as a deflator

TABLE 5.5

The Adjustment Coefficient and the Long-Run Elasticities of the Real Income (Non-oil GDP), Expected Inflation, the Saudi Riyal and US Dollar Short-Market Interest Rate and the Saudi Riyal Exchange Rate against the US Dollar of the Estimated Demand Equations for Real M_0, M_1, M_2 and $M_2{}^a$ which are presented in Table 5.3.

Eqn. No.	LRy	LRp^e	LRDr	LRFr	LRE	LREx	AC
1.1	0.750	-2.798	-0.018		-0.673		0.337
1.2	0.743	-2.825		-0.033	-0.962		0.339
1.3	0.739	-2.850	-0.018				0.335
1.4	0.731	-2.906		-0.028			0.338
1.5	0.719	-2.979					0.331
2.1a	0.785	-1.712	-0.150			-0.358	0.280
2.1b	0.795	-1.923	-0.107		-2.125		0.300
2.2a	0.641	-2.683		-0.096		-0.276	0.248
2.2b	0.710	-2.412		-0.052	-2.994		0.291
2.3	0.765	-2.148	-0.123				0.273
2.4	0.647	-2.832		-0.047			0.257
2.5	0.648	-2.750					0.271
2.6	0.704	-2.375			-2.614		0.305
2.7	0.853		-0.269			-0.821	0.209
3.1	1.001	-1.468		-0.148	-1.442		0.335
3.2	1.071	-1.086	-0.146				0.303
3.3	0.986	-1.635		-0.142			0.322
3.4	1.139		-0.162				0.330
4.1	1.073	-1.854		-0.241	-0.648		0.221
4.2	1.131	-1.619	-0.226				0.166
4.3	1.064	-1.915		-0.238			0.219
4.4	1.239		-0.242				0.190

Key to Abbreviations:

LRy = the long-run elasticity of real income;

LRp^e = the long-run elasticity of expected inflation;

LRDr = the long-run elasticity of the Saudi Riyal short-term market interest rate;

LRFr = the long-run elasticity of the US Dollar short-term interest rate;

LRE = the long-run elasticity of the rate of change in the real expected exchange rate of the Saudi Riyal against the US Dollar;

LREx = the long-run elasticity of the real expected exchange rate of the Saudi Riyal against the US Dollar;

AC = the adjustment coefficient.

Figure 5.2 Actual & Simulated Values of Real M

6.1
6.0
5.9
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0

1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

TIME

REP   - - - - Actual Values   ------ Simulated Values

Figure 5.3 Actual & Simulated Values of Real M1

Y

7.0
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6.0
5.9
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5.0

1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

TIME

REP   - - - - Actual Values   - - - - - - Simulated Values

Figure 5.4 Actual & Simulated Values of Real M2

Y

7.6

7.4

7.2

7.0

6.8

6.6

6.4

6.2

6.0

5.8

5.6

5.4

5.2

5.0

1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989

TIME

REP   - - - - ACTUAL VALUES   ------ SIMULATED VALUES

Figure 5.5 Actual & Simulated Values of Real M2[a]

REP   – – – – Actual Values   - - - - - Simulated Values

TIME

5.3 The Stability Test of the Estimated Demand Equations for Real M_0, M_1, M_2 and M_2^a

Testing for stability of function usually refers to testing for the approximate constancy of the repression coefficients over time. This concept of stability may be tested in a variety of ways, perhaps the most widely applied of these techniques being the Chow (1960) test. Under this test, the data sample is divided into two parts at a chosen point and the two repgressions over the two subperiods, with the full sample regression as a reference, are then compared using an 'F-ratio' to ascertain whether a significant shift occurred in the function.

The Chow test, which is available in TSP (Time Series Processor), is employed in this study to determine the stability of the overall estimated equations for M_0, M_1, M_2 and M_2^a which are displayed in Table 5.3. For the following reasons, the second quarter of 1981 may provide us with the most appropriate splitting point for the purpose of applying this test.

First, as we mentioned earlier, the Saudi economy has undergone two different stages. In the first stage (1973-1982) which represents the oil-boom years, all the major economic and monetary indicators, such as non-oil GDP, aggregate demand, capital formation, monetary aggregates, etc., experienced remarkable growth (see Tables 2.11 and 3.8). This reflects the drastic increase in government expenditure which was due largely to the substantial increase in oil revenues after the sharp rises in oil prices which started in the fourth quarter of 1973. However, in the second stage, these indicators have recorded low growth rates which are mainly due to a sharp decline in government spending, reflecting the substantial drop in oil revenues after the drastic decreases in oil prices which started at the beginning of 1981.

Secondly, high rates of inflation were recorded between 1975 and 1981. However, since 1981 inflation has fallen rapidly, registering very low and, in some cases, negative rates (see Table 2.7).

Thirdly, between 1979 and 1982, the Riyal and US Dollar market interest rates registered considerably high levels. However, since the last quarter of 1982 recorded noticeably lower levels (see Table 5.1).

The calculated F-ratios (Chow ratios) of the estimated demand equations for real M_0, M_1, M_2 and M_2^a which are displayed in Table 5.3 indicate that all the estimated equations are stable at the 5 per cent level of significanceexcepet for equations 2.1a, 2.2 and 2.3 which are found to be unstable at the 5 and 10 per cent of significance (see Table 5.6). This means that the two samples give different relationships.

5.4 The Simulation of the Estimated Equations for Real M_0, M_1, M_2 and M_2^a

The statistical criteria of the estimated equations which are presented in Table 5.3 such as the adjusted correlation coefficient (R^2), the F-test which is used to test the significance of the correlation coefficient and Durbin-h statistic (D-h) which is used to detect first-order autocorrelation, when a lagged dependent appears among the regressors, indicate that the performance of these estimated equations is excellent. Also the Chow-test is used to test the stability of these equations. The test reveals that apart from equations 2.1a, 2.2 and 2.3 which are found to be unstable at the 5 per cent level, all other equations are found to be stable (see Table 5.6).

TABLE 5.6

Chow Stability Test of the Estimated Demand Equation for Real
M_0, M_1, M_2 and $M_2{}^a$ which are presented in Table 5.3

Equation Number	Calculated F
1.1	0.43470
1.2	1.29017
1.3	0.37098
1.4	1.50334
1.5	0.11665
2.1a	2.54570
2.1b	0.43470
2.2a	2.40020
2.2b	2.60260
2.3	2.84837
2.4	2.48608
2.5	0.43845
2.6	2.1000
2.7	2.46677
3.1	1.45028
3.2	1.79814
3.3	1.22930
3.4	2.00523
4.1	1.40958
4.2	2.42046
4.3	1.28384
4.4	2.57315

Notes:

1. The following Chow ratio which is used to generate the Calculated
F-ratios above, is available in TSP (Time-Series Computer Programme).

Chow ratio = $(SSR_0 - SSR_1 - SSR_2) \times (NOB - 2K)/(K \times [SSR_1 + SSR_2])$

where:

SSR_0 = sum squared error of the whole sample;

SSR_1 = sum squared error of the first sub-period;

SSR_2 = sum squared error of the second sub-period;

K   = the number of the explanatory variables including the constant.

NOB = the number of observations

2. (a) The critical values of $F_{0.005} = (3,44) = 2.82$; $F_{0.005} = (4,44) = 2.59$; $F_{0.005} = (5,44) = 2.43$; $F_{0.05} = (6,44) = 2.32$ and $F_{0.05} = (7,44) = 2.23$.

(b) The critical values of $F_{0.10} = (3,44) = 2.22$; $F_{0.10} = (4,44) = 2.08$; $F_{0.10} = (5,44) = 1.99$; $F_{0.10} = (6,44) = 1.92$ and $F_{0.10} = (7,44) = 1.86$.

TABLE 5.7

Comparison of the Statistics of Actual and Simulated Value of the Dependent Variables of the Estimated Demand Equations for Real M_0, M_1, M_2 and $M_2{}^a$ which are displayed in Table 5.3.

Equation Number		Mean	STD DEV	Minimum	Maximum	Sum	Variance
1.1	M_0	5.59	0.43	4.54	6.10	279.68	0.18
	M_0S	5.56	0.38	4.69	5.98	278.38	0.16
1.2	M_0	5.59	0.43	4.54	6.10	279.68	0.18
	M_0S	5.55	0.38	4.68	5.97	277.40	0.15
1.3	M_0	5.59	0.43	4.54	6.10	279.68	0.18
	M_0S	5.57	0.38	4.70	5.99	278.38	0.15
1.4	M_0	5.59	0.43	4.54	6.10	279.68	0.18
	M_0S	5.56	0.38	4.69	5.97	277.76	0.15
1.5	M_0	5.59	0.43	4.54	6.10	279.68	0.18
	M_0S	5.60	0.38	4.74	6.02	279.96	0.14
2.1a	M_1	6.45	0.42	5.34	6.94	322.34	0.18
	M_1S	5.98	0.42	5.03	6.40	299.09	0.17
2.2b	M_1	6.45	0.42	5.34	6.94	322.34	0.18
	M_1S	6.38	0.39	5.45	6.77	319.11	0.16
2.3	M_1	6.45	0.42	5.34	6.94	322.34	0.18
	M_1S	6.28	0.41	5.32	6.68	313.91	0.17
2.4	M_1	6.45	0.42	5.34	6.94	322.34	0.18
	M_1S	6.40	0.39	5.47	6.79	319.75	0.15
2.5	M_1	6.45	0.45	5.34	6.94	322.34	0.18
	M_1S	6.45	0.39	5.54	6.84	322.54	0.15
2.6	M_1	6.45	0.43	5.34	6.94	322.34	0.18
	M_1S	6.35	0.40	5.40	6.80	316.47	0.17
2.7	M_1	6.45	0.42	5.34	6.94	322.34	0.18
	M_1S	6.29	0.44	5.28	6.74	314.47	0.20
3.1	M_2	6.73	0.51	5.54	7.32	336.42	0.26
	M_2S	6.50	0.50	5.41	6.98	324.80	0.25
3.2	M_2	6.73	0.51	5.54	7.32	336.42	0.26
	M_2S	6.50	0.52	5.39	7.01	325.03	0.27
3.3	M_2	6.73	0.51	5.54	7.32	336.42	0.26
	M_2S	6.51	0.49	5.44	7.00	325.73	0.24
3.4	M_2	6.73	0.51	5.54	7.32	336.42	0.26
	M_2S	6.45	0.54	5.29	6.69	322.47	0.29

TABLE 5.7 (Continued) ....

Equation Number		Mean	STD DEV	Minimum	Maximum	Sum	Variance
4.1	M_2a	6.82	0.57	5.56	7.53	341.12	0.33
	M_2aS	6.90	0.45	5.84	7.32	344.84	0.20
4.2	M_2a	6.82	0.57	5.56	7.53	341.12	0.33
	M_2aS	7.21	0.58	6.02	7.87	360.69	0.33
4.3	M_2a	6.82	0.57	5.56	7.53	341.12	0.33
	M_2aS	6.86	0.44	5.81	7.29	343.24	0.20
4.4	M_2a	6.82	0.57	5.56	7.53	341.12	0.33
	M_2aS	7.58	0.59	6.34	8.23	378.82	0.35

Note:

(S) at the end of the abbreviation indicates the simulated value of the dependent variable.

TABLE 5.8

The Simulation Statistical Criteria of the Estimated Demand Equations for Real M_0, M_1, M_2 and $M_2{}^a$ which are presented in Table 5.3

Equation Number	RMSE	ME	Theil's Inequality Coefficient	FEB	FEV	FEC
1.1	0.095	0.06	0.00031	0.27	0.23	0.53
1.2	0.090	0.05	0.000251	0.26	0.22	0.52
1.3	0.080	0.03	0.000205	0.10	0.27	0.63
1.4	0.090	0.04	0.000239	0.20	0.26	0.54
1.5	0.078	-0.00563	0.000200	0.00514	0.34	0.65
2.1a	0.47	0.47	0.00526	0.99	0.00014	0.01
2.2b	0.09	0.06	0.000185	0.54	0.10	0.36
2.3	0.18	0.17	0.000760	0.90	0.00348	0.10
2.4	0.08	0.05	0.000150	0.43	0.18	0.39
2.5	0.06	-0.00391	0.0000907	0.00403	0.35	0.64
2.6	0.07	-0.0040	0.000100	0.0048	0.36	0.65
2.7	0.17	0.16	0.000670	0.89	0.01	0.10
3.1	0.24	0.23	0.00125	0.95	0.00508	0.050
3.2	0.23	0.23	0.00120	0.95	0.000368	0.050
3.3	0.22	0.21	0.00107	0.94	0.00939	0.053
3.4	0.29	0.28	0.00179	0.96	0.00580	0.040
4.1	0.18	-0.07	0.00074	0.17	0.48	0.36
4.2	0.39	-0.39	0.0032	0.99	0.000135	0.01
4.3	0.17	-0.04	0.000632	0.06	0.54	0.39
4.4	0.76	-0.75	0.01	0.99	0.000592	0.0045

Key to Abbreviations:

RMSE = the Root-Mean-Squared-Error;

ME   = Mean Error;

FEB = the Fraction of Error due to Bias;

FEV =   "   "   "   Variation;

FEC =   "   "   "   Covariation.

In this section an attempt is made to test the performance and forecasting power of these equations through simulating them over the period 1976:1-1988:2 using the available time series computer programme (TSP in our case). The simulation results are displayed in Tables 5.7 and 5.8. The comparison of indicators of actual values with that of the simulated values of all the estimated equations dependent variables is presented in Table 5.7 and the simulation error measures are presented in Table 5.8. The content of these tables shows that the estimated equations in Table 5.3 are able to track the actual values of these equations' dependent variables fairly closely and, in general, they perform very satisfactorily. Table 5.8, which contains the simulation error measures shows that RMSE (Root Mean Square Error) ranges between 0.06-0.76 and ME (Mean Error) between -0.0039-0.47 and Theils' Inequality Coefficient is close to zero in all these equations. This indicates that these equations perform satisfactorily and that they have good forecasting performance (i.e. the ability of these equations to simulate is very good). Other error indicators such as FEB (the fraction of error due to bias), FEV (the fraction of error due to variation) and FEC (the fraction of error due to covariation) are as desired, the latter (FEC) indicates that the systematic errors among equations are at a minimum.

CONCLUSION

The major empirical findings obtained from estimating the demand equations for real M_0, M_1, M_2 and M_2^a can be summarized as follows:

Firstly, in all the estimated demand equations for real M_0, M_1, M_2 and M_2^a, the real income (non-oil GDP) is found to be statistically

significant at the 5 per cent level with long-run elasticities around 0.74, 0.73, 1.05 and 1.13 respectively.

Secondly, in all the estimated demand equations for real M_0, M_1 and M_2, the expected inflation is found to be statistically significant at the 5 per cent level with noticeably high long-run elasticities (around -2.87, -2.35 and -1.40 respectively). This finding indicates that the Saudis are very sensitive to inflation and, consequently, they view real physical assets as an attractive alternative to monetary assets.

Thirdly, as predicted, the Riyal short-term market interest rate is found to be statistically significant at the 5 per cent level in all the estimated demand equations for real M_1, M_2 and M_2^a. Its long-run elasticities with respect to the demand for real M_1, M_2 and M_2^a are significantly lower than unity (around -0.186, -0.154 and -0.235 respectively).

Fourth, as we expected, the US Dollar short-term market interest rate is found to be statistically significant at the 5 per cent level in all the estimated demand equations for real M_2 and M_2^a. However, it has a negligible short- and long-run effect on the demand for real M_2 and M_2^a.

Fifth, the adjustment coefficients of the estimated demand equations for real M_0, M_1, M_2 and M_2^a are relatively low ranging from 0.166 to 0.339. This indicates that there is a relatively long period of adjustment between the actual and desired (equilibrium) level of the demand for real M_0, M_1, M_2 and M_2^a.

Sixth, according to the statistical criteria of the estimated demand equation for real M_0, M_1, M_2 and M_2^a, it would seem that equations 1.5, 2.3, 3.2 and 4.2 represent very appropriate estimates of the demand for real M_0, M_1, M_2 and M_2^a respectively (see Table 5.3).

Moreover, these equations are consistent with theory and the findings of many empirical studies on the demand for real M_0, M_1, M_2 and M_2^a in developed and less-developed countries.

Seventh, the Chow test is used to test the stability of the estimated demand equations for real M_0, M_1, M_2 and M_2^a in Table 5.3. The result of this test revealed that all the estimated equations are stable at the 5 per cent level of significance, except for equations 2.1a, 2.2 and 2.3 which are found to be unstable at the 5 per cent and 10 per cent levels of significance (see Table 5.6).

Eighth, the performance and forecasting power of the estimated demand equations for real M_0, M_1, M_2 and M_2^a in Table 5.3 are tested through simulating these equations over the period 1976:1-1988:2. The simulation results (see Tables 5.7 and 5.8) indicate that the estimated equations are able to track the actual values of *these equations'* dependent variables fairly closely (i.e. they perform very satisfactorily) and they have good forecasting power.

APPENDIX A

FACTORS AFFECTING RIYAL MARKET INTEREST RATE:
AN EMPIRICAL INVESTIGATION

1.   Factors Affecting the Riyal Market Interest Rate

Our empirical findings in Chapter V reveal that the riyal market interest rate exerts a significant influence on the demand for real M_1, M_2 and M_2^{α} . This implies that the Riyal market interest rate plays an important role in the Riyal money market and it is expected to play an even more important role in the future. Therefore the question that needs to be answered is :'What are the factors affecting the Riyal market interest rate?' In this appendix we will try to answer this question empirically. However, before doing so we will briefly highlight the factors affecting the nominal interest rate in developed and less-developed countries. In the light of many empirical studies on the factors affecting the nominal interest rate in the major developed countries, it seems that there is general agreement among economists in these countries (see, for example, Friedman, M. 1969, Friedman, B. 1975) that the nominal interest rate is affected by several major factors, namely:

(1)   The role of government borrowing and lending (buying and selling of bonds, treasury bills ... etc.);
(2)   money supply growth;
(3)   inflation;
(4)   availability of loanable or investment funds;
(5)   speculation on the capital market;
(6)   the yields of other financial assets;
(7)   the level of the socio-economic, political, institutional (finance and banking) structure;
(8)   geographical development and infrastructure.

As far as the factors affecting the interest rate in less-developed countries are concerned, Ghatak (1981) indicated the interest rate administered rather than that determined by the organised money market. This would imply that the effect of normal operations of the laws of demand and supply will not be fully reflected in the observed interest rates. This may be due to several factors:

(1)   limited size of the organised financial market;
(2)   the institutional pegging of interest rates;
(3)   limited array of financial assets;
(4)   undeveloped money markets;

Bottomley (1975) and Wai (1977) mentioned several factors affecting the interest rate in the organised money market of less-developed countries:

(1)   availability of loanable funds;
(2)   the role of the government in controlling the interest rate of the organised money market;
(3)   the level of political and institutional (finance and banking) development;
(4)   the size of the organised money market; and
(5)   the rate of inflation.

Let us now discuss the factors affecting the Riyal market interest rate in Saudi Arabia. Because the Saudi economy is *very open* with complete capital *mobility* and SAMA have limited control over money supply and Riyal interest rate, one would expect that external factors such as foreign interest rates, particularly the U.S. Dollar market interest rate and the expected movements of the Riyal exchange, especially against the U.S. Dollar, would have a significant and positive influence on the Riyal market interest rate. Figure 5.1 and Table 5.1 show that when there are no disturbances in the Riyal money market, such as speculative transactions in the Riyal resulting from predicting the movements in Dollar/Riyal rate by investors inside and

outside Saudi Arabia, the Riyal interest rate moves closely with that of the U.S. Dollar. In this appendix the impact of both the U.S. Dollar market interest rate and the expected movement of the Saudi Riyal to the U.S. Dollar on the Riyal market interest rate will be tested. That is, an attempt will be made to test the hypothesis that an increase in the U.S. Dollar interest rate and/or an expected depreciation of the Riyal against the U.S. Dollar (i.e. exchange rate increases) encourages the purchasing of U.S. Dollars from Saudi commercial banks by investors (both inside and outside Saudi Arabia); this in turn leading to the depletion of the commercial banks' liquidity. Consequently, the commercial banks will increase their Riyal interest rate to obtain liquidity. Presley (1985) indicated that in 1978 there was a general feeling in Saudi Arabia that the Saudi Riyal would depreciate against the U.S. Dollar. Combined with higher interest rates abroad, particularly the U.S. interest rate, this led to a running down of Saudi domestic bank deposits with preference for Dollar deposits. This created a severe shortage of bank liquidity which led to an increase in the Riyal interest rate. Hence it can be postulated that a rising U.S. Dollar market interest rate and the expected exchange rate depreciation would have a significant and positive influence on the Riyal interest rate. In addition it can be assumed that the commerical banks' liquidity (excess liquidity) may exert a significant and negative influence on the Riyal interest rate. In the remainder of this appendix an attempt is made to test empirically the nominal relationship between the Riyal market interest and the factors mentioned above, as well as other factors such as expected inflation and the growth of the money supply.

The Empirical Results

After experimenting with different models (static and dynamic models) and specifications in linear and log-linear forms using quarterly data run from 1979:1-1988:2, we find that the following estimated long-run equations are appropriate estimates of the nominal Riyal interest rates' relationship:

$$\ln DI = 0.47941 + 0.75960 \ln Fr \qquad \ldots \ldots \qquad (1)$$
$$\quad\quad (2.98) \quad (11.08)$$

$$R^2 = 0.7732 \qquad F = 123 \quad D\text{-}W = 1.54 \quad SEE = 0.1339$$

$$\ln DI = -1.6186 + 0.92011 \ln Fr + 2.2038 \ln Ex - 0.12388 \ln EL \ldots \quad (2)$$
$$\quad\quad (1.14) \quad (7.23) \quad\quad (2.20) \quad\quad (2.00)$$

$$R^2 = 0.8100 \qquad F = 47 \quad D\text{-}W = 1.77 \quad SEE = 0.1275$$

where:

DI = Riyal short-term market interest rate
Fr = U.S. Dollar short-term market interest rate
Ex = the expected exchange rate of Riyal against the U.S.Dollar
EL = the commercial banks' excess liquidity defined as the current deposits of the commercial banks with SAMA, plus other deposits with SAMA (Banking Security Deposit Accounts)

Notes:

(1)   The numbers in parenthesis below the coefficient estimates are the absolute values of the t-ratios
R^2 is the correlation coefficient
SEE is the standard error of the regression
D-W is the Durbin Statistic to test for first-order serial correlation

(2)   TSP (Time-Series Computer Programme) is employed in estimating the above equations

(3)   The Ordinary Least Squares Method (OLSQ) is used to estimate the above equations

(4)   Quarterly data that run from 1979:1-1988:2 are used to estimate the above equations

(5)   The expected exchange rate of Riyal against the U.S. Dollar is generated using ARIMA (Box-Jenkins) time series model of auto-regressive = 0, difference = 1, and moving average = 1 (for more details see Chapter 5).

Equation (1) shows that the U.S. Dollar market interest rate explains around 77% of the variations in the Riyal interest rate and its coefficient is highly significant with right sign. Equation 2 reveals that the coefficients of the explanatory variables are statistically significant (at the 5 per cent level) with right signs. Moreover, the statistical criteria of this equation, such as the correlation coefficient and Durbin-W statistic (D-W) which is used to detect first-order correlation, indicates that the over-all fit of this equation is very satisfactory. Equation 2 also demonstrates that the U.S. Dollar market rate is statistically highly significant with elasticity around unity. Moreover, it shows that the expected exchange rate's elasticity is considerably high. In short, the empirical findings indicate that external factors play an important role in determining the movement of the Riyal interest rate.

APPENDIX B

THE DATA AND THEIR SOURCES

The following data are used in estimating the demand for real m, m_1, m_2 and $m_2{}^a$

Period		m	m_1
1976:	1	94.153	208.464
	2	100.517	230.625
	3	107.143	243.149
	4	115.700	265.159
1977:	1	125.187	297.185
	2	141.124	325.384
	3	150.974	341.949
	4	167.336	395.531
1978:	1	183.656	457.140
	2	187.652	478.592
	3	190.466	506.183
	4	201.810	517.782
1979:	1	216.245	521.876
	2	215.298	517.195
	3	222.832	526.082
	4	243.130	561.013
1980:	1	254.388	560.714
	2	248.900	569.200
	3	251.100	588.200
	4	256.800	589.600
1981:	1	253.884	621.632
	2	272.293	660.683
	3	290.213	665.407
	4	285.480	706.486
1982:	1	289.265	728.627
	2	311.958	755.834
	3	333.173	788.173
	4	329.885	802.490
1983:	1	342.177	847.619
	2	358.439	860.293
	3	375.325	884.416

	4	352.438	845.075
1984:	1	344.577	857.413
	2	365.541	842.205
	3	342.373	817.846
	4	352.156	832.197
1985:	1	349.289	840.447
	2	386.653	880.699
	3	362.058	848.129
	4	372.604	852.396
1986:	1	387.093	872.193
	2	413.771	889.301
	3	391.524	868.670
	4	430.266	956.541
1987:	1	413.782	907.265
	2	445.678	936.073
	3	422.713	933.262
	4	432.255	989.968
1988:	1	419.456	948.667
	2	417.291	1035.069

Period		m_2	$m_2{}^a$
1976:	1	255.415	260.799
	2	279.826	285.698
	3	294.362	300.202
	4	312.247	323.500
1977:	1	348.155	356.473
	2	379.407	387.910
	3	397.846	405.744
	4	455.772	469.159
1978:	1	525.695	536.226
	2	553.018	566.127
	3	584.716	595.814
	4	598.064	610.690
1979:	1	604.459	619.845
	2	608.378	624.010
	3	616.228	635.169
	4	657.199	676.682
1980:	1	668.163	692.143
	2	680.300	708.500
	3	714.100	752.300
	4	727.900	774.400
1981:	1	767.158	815.536
	2	829.854	884.878
	3	840.795	893.314
	4	918.780	996.999
1982:	1	983.075	1050.000
	2	1031.919	1123.337
	3	1071.346	1156.923
	4	1086.782	1185.728
1983:	1	1133.236	1228.863
	2	1156.781	1255.317
	3	1185.415	1285.315
	4	1184.677	1363.980
1984:	1	1250.746	1427.761
	2	1248.361	1438.232
	3	1231.505	1427.119
	4	1251.354	1457.773

1985:	1	1265.142	1504.472
	2	1319.507	1534.702
	3	1284.407	1495.634
	4	1311.667	1531.354
1986:	1	1335.362	1578.069
	2	1356.578	1597.987
	3	1341.524	1622.532
	4	1454.546	1780.488
1987:	1	1393.697	1733.013
	2	1410.352	1713.447
	3	1418.192	1720.021
	4	1478.101	1816.505
1988:	1	1420.629	1748.667
	2	1507.132	1869.460

Period		Ey	p^e
1976:	1	499.399	0.197
	2	524.483	0.064
	3	556.862	0.045
	4	597.400	0.028
1977:	1	638.708	0.024
	2	672.999	0.028
	3	718.072	0.011
	4	778.396	0.011
1978:	1	856.487	-0.008
	2	937.372	-0.029
	3	983.395	-0.005
	4	1026.515	0.000
1979:	1	1060.090	0.006
	2	1069.456	0.006
	3	1128.503	0.005
	4	1174.826	0.008
1980:	1	1237.786	0.011
	2	1282.410	0.005
	3	1333.290	0.024
	4	1401.950	-0.002
1981:	1	1445.782	-0.002
	2	1504.663	0.020
	3	1554.012	0.008
	4	1619.206	0.007
1982:	1	1683.462	-0.001
	2	1760.820	-0.000
	3	1809.442	0.002
	4	1854.473	0.003
1983:	1	1925.617	0.004
	2	2012.537	-0.019
	3	2095.664	-0.005
	4	2099.323	-0.029
1984:	1	2091.622	0.007
	2	6097.597	0.001
	3	2122.343	0.003
	4	2107.011	-0.004

1985:	1	2095.478	-0.007
	2	2072.762	-0.016
	3	2092.173	-0.011
	4	2054.594	-0.014
1986:	1	2028.510	-0.001
	2	1970.508	-0.007
	3	1988.788	-0.010
	4	2037.683	-0.015
1987:	1	1964.786	-0.008
	2	1953.191	-0.009
	3	1960.420	-0.009
	4	1955.038	-0.009
1988:	1	1922.612	-0.009
	2	1898.942	-0.009

Period	Fr	Dr
1976: 1	5.530	4.500
2	6.050	5.500
3	5.740	4.500
4	5.230	4.125
1977: 1	5.250	1.500
2	5.760	4.000
3	6.490	5.000
4	7.100	2.375
1978: 1	7.470	2.750
2	7.770	5.000
3	8.920	3.500
4	11.630	3.375
1979: 1	10.570	8.875
2	10.670	7.000
3	12.130	8.625
4	14.740	8.625
1980: 1	17.110	17.500
2	11.150	9.250
3	12.080	10.500
4	17.100	17.000
1981: 1	16.330	12.500
2	17.470	14.625
3	18.440	14.750
4	13.800	10.625
1982: 1	15.030	14.250
2	14.990	15.000
3	12.020	10.750
4	9.710	7.687
1983: 1	9.290	9.187
2	9.400	9.750
3	9.990	9.875
4	9.840	10.000
1984: 1	10.190	9.375
2	11.630	11.625
3	11.750	11.375
4	9.270	8.812

1985:	1	9.040	9.125
	2	8.060	7.625
	3	8.120	8.750
	4	8.050	7.875
1986:	1	7.700	8.625
	2	6.900	8.375
	3	6.040	7.250
	4	6.110	6.375
1987:	1	6.375	6.500
	2	7.143	6.729
	3	7.457	6.896
	4	7.583	6.458
1988:	1	6.833	6.937
	2	7.603	7.437

Period		Ex	CP
1976:	1	3.535	79.87
	2	3.535	85.16
	3	3.535	89.04
	4	3.535	91.53
1977:	1	3.535	93.78
	2	3.535	96.44
	3	3.535	97.50
	4	3.530	97.11
1978:	1	3.510	94.96
	2	3.460	94.59
	3	3.450	94.61
	4	3.330	95.04
1979:	1	3.320	95.54
	2	3.360	95.96
	3	3.380	96.62
	4	3.360	97.52
1980:	1	3.370	98
	2	3.330	100
	3	3.330	100
	4	3.320	100
1981:	1	3.330	101.7
	2	3.350	102.5
	3	3.410	103.2
	4	3.420	103.3
1982:	1	3.420	103.4
	2	3.420	103.7
	3	3.440	104
	4	3.440	104.4
1983:	1	3.440	102.9
	2	3.450	102.5
	3	3.450	100.1
	4	3.480	100.5
1984:	1	3.500	100.5
	2	3.520	100.7
	3	3.510	100.3
	4	3.560	99.7

1985:	1	3.580	98.4
	2	3.610	97.4
	3	3.648	96.2
	4	3.650	96.0
1986:	1	3.650	95.3
	2	3.650	94.4
	3	3.750	93.2
	4	3.750	90.2
1987:	1	3.750	93.6
	2	3.755	93.7
	3	3.760	92.9
	4	3.765	92.7
1988:	1	3.769	93.8
	2	3.774	94.5

Period	Y	E
1976: 1	500.723	0.000
2	525.886	0.000
3	558.351	0.000
4	598.630	0.000
1977: 1	638.238	0.000
2	673.265	0.000
3	720.327	0.000
4	780.152	0.001
1978: 1	864.724	-0.006
2	927.148	-0.014
3	979.552	-0.003
4	1021.081	-0.035
1979: 1	1046.646	-0.003
2	1086.950	0.012
3	1132.148	0.006
4	1181.912	-0.006
1980: 1	1241.839	0.003
2	1275.964	-0.012
3	1338.321	0.000
4	1404.072	-0.003
1981: 1	1448.242	0.003
2	1501.219	0.006
3	1555.692	0.018
4	1619.589	0.003
1982: 1	1691.018	0.000
2	1751.573	0.000
3	1804.668	0.006
4	1848.593	0.000

Period		Y	E
1983:	1	1938.496	0.000
	2	1998.150	0.003
	3	2078.996	0.000
	4	2083.213	0.009
1984:	1	2092.394	0.006
	2	2100.685	0.006
	3	2104.051	-0.003
	4	2094.073	0.014
1985:	1	2087.704	0.006
	2	2086.081	0.008
	3	2082.444	0.011
	4	2050.734	0.000
1986:	1	2011.060	0.000
	2	1993.909	0.000
	3	1995.047	0.027
	4	2048.729	0.000
1987:	1	1911.719	0.000
	2	1912.062	0.001
	3	1932.619	0.001
	4	1942.586	0.001
1988:	1	1893.081	0.001
	2	1873.386	0.001

Key to Abbreviations:

m_0, m_1, m_2 and $m_2{}^a$ are the real money definitions defined as follows:

m_0 = the currency in the hands of the non-bank public

m_1 = m_0 + demand deposits of the public at the commercial banks

m_2 = m_1 + time and saving deposits

$m_2{}^a$ = m_2 + foreign currency deposits

y = the real expected income (non-oil GDP)

Ey = the real expected income (expected non-oil GDP)

D_r = the Saudi Riyal short-term market interest rate

F_r = the US Dollar short-term market interest rate

Ex = the expected exchange rate of the Saudi Riyal against the US Dollar

E = the rate of change in the expected exchange rate of the Saudi Riyal against the US Dollar

CP = the Consumer Price Index (1980 = 100)

Notes:

[1] All of the data are available on a quarterly basis except for the income (non-oil GDP) series which is available only annually. Therefore, an interpolation technique [for more information about this technique, see Section 5.2] is used to obtain quarterly data from the corresponding annual series. Moreover, the annual income series is obtained from various issues of SAMA Annual Reports.

[2] The data of nominal m, m_1, m_2 and $m_2{}^a$ are obtained from International Financial Statistics (IFS).

[3] The data of the exchange rate of Saudi Riyal to US Dollar which are used to generate the expected exchange rate are obtained from International Financial Statistics (IFS).

[4] The data of the consumer price index (1980 = 100) which are used to generate the expected rate of inflation are also obtained from International Financial Statistics (IFS).

CHAPTER VI

THE MONEY SUPPLY PROCESS IN SAUDI ARABIA:

A THEORETICAL AND EMPIRICAL INVESTIGATION

INTRODUCTION

In Saudi Arabia, oil revenues and the money supply are closely related. The sharp rises in oil revenues during the 1970s led to substantial increases in the country's holdings of foreign assets which mainly accounted for the remarkable growth of domestic liquidity during the 1970s and early 1980s. In contrast to the usual situation in most other developing countries, foreign assets do not, however, have an immediate monetary impact in Saudi Arabia. This is because the oil revenues flow directly to the government. Only when the government injects these revenues into the domestic income stream through government expenditures is the inflow of foreign exchange translated into domestic liquidity. Table 6.1 shows that the oil revenue public sector domestic expenditures, foreign assets and money supply (M_3) followed an increasing trend during the 1973-1982 period.

The plan for this chapter is as follows:
In the first section, the Saudi monetary aggregates are discussed. In section two the relationship between the money supply and the factors affecting the change in money supply is analyzed theoretically and empirically. In secton three, we shed light on the monetary base and money multipliers in Saudi Arabia. This section is divided into the following three subsections:

(1) the components and source of the Saudi monetary base are highlighted;

(2) the controllability of the monetary base in Saudi Arabia is discussed;

(3) the Saudi money multipliers of alternative money definitions are derived.

Finally, the behaviour of the Saudi money multipliers is analyzed through studying the impact of the non-bank public, the banks and SAMA.

6.1 THE SAUDI MONETARY AGGREGATES

As we have previously mentioned, in the absence of diverse financial assets in Saudi Arabia, the definition of money is simplified to only four monetary aggregates: currency in the hands of non-bank public (M_0); M_0 plus demand deposits of the public at commercial banks (M_1); M_1 plus time and saving deposits of the public at the commercial banks (M_2); and M_2 plus other quasi-monetary deposits which include deposits for Letters of Credit, deposits for Letters of Guarantee and residents' foreign deposits.

Tables 6.2 and 6.3 show that the monetary aggregates $(M_1$, M_2 and $M_3)$ grew remarkably between 1971 and 1982 at an annual rate of 35.6%, 36.2% and 36.6% respectively. This was due largely to the increasing rate of the growth of budgetary expenditures and to the increase in the banking system's claim to the private sector. Apparently the high increases in monetary aggregates were not fully offset by the increases in the private sector balance of payments deficits which include payments for imports of goods and services and capital outflow. However, after 1982 the monetary aggregates experienced very low growth

rates. During the period 1983 to 1986 they registered annual rates of 2.3%, 3.9% and 6%. This could be attributed largely to the reduction in domestic government expenditure and to the decrease in commercial banks' claims on the private sector (see Table 6.3). In the next section we will discuss in more detail the factors affecting the monetary aggregates in Saudi Arabia.

Let us now trace the growth of the money supply's components. Table 6.5 shows that these components grew remarkably during the period 1971 to 1982. The currency in circulation increased sharply at an annual rate of 29.7%. This was largely due to the enormous increases in government expenditures and the corresponding high growth in income and high rates of inflation. The demand deposits also increased remarkably at an annual rate of 42.7%. This was largely due to substantial increases in non-oil GDP (see the estimated equation in subsection 5.1.2) resulting from the enormous increases in government expenditures, the expansion of the banking system, the growth of the banking habit among the people, and high rates of inflation. Time and saving deposits also expanded greatly between 1971 and 1982, growing at an annual rate of 45.4%. This high rate of growth could well again be attributed to the high growth rates of non-oil GDP (see the estimated equation in subsection 5.1.2), expansion of the banking system, changes in Saudis' attitude towards acceptance of interest payments and the high levels of the Riyal interest rate. Finally, other quasi-monetary deposits which include deposits for Letters of Credit, deposits for Letters of Guarantee and residents' foreign deposits increased at an annual rate of 40.9%. This reflects the upward movement of the international capital and money market, increases in the import levels and high levels of foreign interest rates. These deposits represent perfect liquidity (no capital loss). They can be channelled into the economy at any time.

The other quasi monetary deposits are basically affected by domestic interest rate, world inflation, the movement of international capital and the money market. In short, these deposits represent a very important pool of liquidity for the economy and an important element in the liabilities' side of the commercial banks in the case of Saudi Arabia. Apparently, the importance of M_3 emerges from the fact that it contains these deposits.

6. 2 FACTORS AFFECTING CHANGES IN THE SAUDI MONEY SUPPLY

The change of money supply (M_3) in Saudi Arabia depends mainly upon three factors:

(1)   The domestic government expenditures are important factors in determining the money supply (see Al-Saati 1986, Al-Ali 1988 and Looney 1987). The stronger the relationship between government expenditure and the money supply, the greater the money supply will be when government expenditures rise. During the first and second development plan period, 1970-1980, this factor recorded remarkable growth rates which were largely responsible for the substantial growth of the money supply during this period (see Table 6.3).

(2)   The commercial banks' claims on the private sector has also a positive and important impact on the money supply. This factor increased noticeably at an annual growth rate of 34.4% between 1971 and 1982 (see Table 6.3).

(3)   The net private sector balance of payments deficit, which includes payments for goods and services as well as capital outflow, has a negative and significant influence on the money supply, i.e. the

greater the deficit, the more Riyals are exchanged for foreign currencies and the lower the money supply (M_3).

In the remainder of this sector, the importance of these factors in determining the money supply (M_3) will be discussed and an attempt will be made to test empirically the relationship between these factors and the money supply.

Table 6.8 shows that during 1972-1982, the domestic government expenditure-money supply(M_3) ratio registered very high levels, ranging between 1.273 and 1.814. This was because the domestic government expenditure increased at a high annual growth rate (41%) during this period. However, since 1982 this ratio has witnessed a rapid decline. This may largely be due to the noticeable decrease in the domestic government expenditures resulting from the sharp fall in oil revenues and the completion of the major infrastructural projects. This probably may also be attributed to the growth of money supply which exceeded the growth of the domestic government expenditures (see Table 6.3).

The domestic government expenditure-money supply ratio indicates that the domestic government expenditure should have a significant influence on the money supply in Saudi Arabia. To confirm this, we estimated the nominal relationship between money supply (M_3) and domestic government expenditure using a simple regression equation in a log-linear form and annual data runs from 1968 to 1987. The results, obtained from using the Ordinary Least Squares Method (OLSQ) revealed that D-W is noticeably low which indicates the existence of auto-correlation among the error terms. Therefore, an autocorrelation test using the Cochrane-Orcutt method was carried out and gave the following regression equation:

$$\ln M_3 = -0.89348 + 0.54683 \ln G \qquad \qquad ....(6.1)$$
$$\qquad \quad (2.26) \quad (6.53)$$
$$R^2 = 0.710 \quad F = 43 \quad D\text{-}W = 2.13 \quad SEE = 0.115$$

where:

M_3 = the money supply

G = the domestic government expenditure

Figures in parenthesis refer to t-Statistic

As can be seen from the above empirical results, around 71% of the variations in money supply are explained by the variations of domestic government expenditure. Moreover, the domestic government expenditure is found to be statistically highly significant. In short, this result reflects clearly the importance of domestic government expenditure in determining the money supply in Saudi Arabia. Darrat (1981) pointed out that since the primary determinant of monetary growth in Saudi Arabia is the domestic government expenditure, therefore effective control over money supply growth and price level lies in a rationalization of government expenditure. Al-Ali (1988) indicated that during the first development plan period, 1970-1975, price levels changed moderately during the first two years of the plan but, when government expenditures, especially on projects, started to increase as a result of the 1973 oil price rises, prices started to increase at a higher rate reaching a peak annual rate of 34.6 during the last year (1975) of the plan. The reason for this acceleration was that government expenditure (especially on projects) increased at a greater rate than the economy's capability to absorb. Demand increased as a result of the crash development projects while the supply side of the economy was unable to respond accordingly. Insufficient local supply put more reliance on imports which carried with them prices prevailing in the countries of origin, mainly European and other western countries. However, during

the second development plan period, 1975-1980, decision-makers in Saudi Arabia saw a reduced inflation rate as one of their main priorities, and government expenditures were used as an instrument to achieve this. Inflation was reduced from 31.5% at the beginning of the plan to 3.6% in 1979/1980. Reduction of the inflation rate by using government expenditure as an instrument was greatly facilitated by the development of infrastructures, elimination of bottlenecks and the growth of the productive capacity of other sectors. Moreover, Al-Ali tested the relationship between inflation and domestic government expenditure using annual data run from 1970 to 1986. His empirical results are:

$$\text{Log } P_t = 2.85 + 0.338 \text{ Log } G_t \qquad \ldots (6.2)$$
$$R^2 = 0.88 \qquad D\text{-}W = 2.11$$

where:

P_t = the inflation rate

G_t = the domestic government expenditure

Apparently, the result shows that government expenditure is statistically highly significant with 88% of the change in price levels related to change in government expenditures.

Looney (1987) pointed out that government domestic spending, even with a budget surplus, has been an effective fiscal policy in controlling the money supply (i.e. to increase or decrease the money supply).

In short, there is a close relationship between domestic government expenditure and domestic liquidity and inflation in Saudi Arabia. The fiscal policy (the government revenue comes almost exclusively from abroad rather than from domestic sources such as taxes, i.e. the domestic government expenditure is the only fiscal policy instrument in Saudi Arabia) plays an important role both in determining the growth of money supply and controlling price levels. Nevertheless, monetary policy can play an important role in smoothing the day-to-day

or week-by-week fluctuations of money stock. This can be done through the monetary policy tools which are available to SAMA, such as the required reserve ratio, sale of forward Dollar, swaps, placements of funds on behalf of Saudi government agencies and bankers' security deposit accounts (for more details see chapter 3). That is, the monetary policy does not have an important role in overall changes in the Saudi money supply.

During 1971-1980, the commercial banks' claims on the private sector-M_3 ratio fluctuated around 0.40. However the ratio declined steadily between 1980 and 1987, registering an average of 0.41 (see Table 6.8). This decline could be attributed to several factors:

(1)   The Saudi government, through its specialized credit agencies has provided a great number of low-cost medium and long-term (interest-free) loans to the private sector to finance its investments in the industrial, agricultural and construction sectors.

(2)   Many economists in Saudi Arabia have argued that the domestic lending market is undeveloped and unable to absorb the funds accumulating with the commercial banks.

(3)   The absence of a legal code specifically designed to deal with modern contractual business agreements and finance in Saudi Arabia, and the fact that the question of charging interest remains unsolved, are the main obstacles in the way of the Saudi commercial banks' ability to increase their credits to the private sector and create a developed domestic lending market.

(4)   The Saudi banks maintain a policy of lending short-term credits to finance mainly the trade and construction sectors, because these sectors require mainly short-term credit and the risk involved in financing them is very low.

(5)   The Saudi financial markets outside the commercial banks are highly rudimentary.

(6)   Since 1981, Saudi economic activities have declined sharply. This may largely be due to sharp decreases in the domestic government expenditures associated with a fall in oil-revenues.

Owing to the above factors, the commercial banks' foreign assets increased substantially during the 1970s and mid-1980s.

In the light of the above discussion, one would have expected the commercial banks' credit to the private sector to have had an insignificant impact on the money supply. However, this assumption will now be tested empirically.

During 1972-1980 the net private sector balance of payments deficits-M_3 ratio registered a very high level, ranging between -1.0533 and -1.700 (see Table 6.8). This could well be attributed to the substantial increases in the private sector's economic activities, this in turn being largely due to the sharp increases in government expenditures. As a result of this, imports experienced high growth rates during the same period (1972-1980). However, since 1980, this ratio has declined steadily. This decline could well be attributed to decreases in the private sector's economic activities which led to noticeable declines in import levels.

The high levels of the net private sector balance of payments deficits-M_3 ratio (see Table 6.8) reflect the significance of this factor's negative influence on the money supply in Saudi Arabia. Al-Saati (1986) pointed out that this factor (the net private sector balance of payments deficits) caused a 74.9 per cent drain on private domestic liquidity in the first five-year development plan, 86.9 per cent in the second development plan and 85.8 per cent in the period 1970-1979. Thus the 100 per cent injection of money supply by

government expenditure and commercial bank credit caused only a 25.1 per cent increase in money supply during the first development plan and a 13.1 per cent increase in the second development plan.

Before concluding this section, we made an attempt to test empirically the nominal relationship between money supply (M_3) and domestic government expenditure, commercial banks' claims on the private sector and the net private sector balance of payments deficit, using annual data run from 1968 to 1987. We then experimented with different models (static and dynamic models) in linear and log-linear forms, and found that the following estimated equations represent appropriate estimates of the relationship above:

$$\ln M_3 = -0.013434+0.71208\ln GE+0.11741\ln CBC-0.55292\ln NPD+0.77143\ln M_{3_{t-1}} \quad ...(6.3)$$
$$\quad\quad\quad (0.14) \quad (2.60) \quad\quad (1.10) \quad\quad (2.00) \quad\quad (9.11)$$
$$\overline{R}^2 = 0.997825 \quad F = 2180 \quad D\text{-}h = 1.86 \quad SEE = 0.07436$$

$$\ln M_3 = 0.093818+0.75803\ln GE-0.55611\ln NPD+0.84505\ln M_{3_{t-1}} \quad\quad ...(6.4)$$
$$\quad\quad\quad (1.55) \quad (2.78) \quad\quad\quad (2.10) \quad\quad\quad (16.11)$$
$$\overline{R}^2 = 0.997797 \quad F = 2869 \quad D\text{-}h = 1.58 \quad SEE = 0.074833$$

where

M_3 = the money supply

GE = the domestic government expenditure

CBC = the commercial banks' claims on the private sector

NPD = the net private sector balance of payments deficit defined as the Saudi private sector import values plus its investment abroad minus the private sector export values plus its returns from foreign investments

Notes:
(1) The numbers in parenthesis below the coefficient estimates are the absolute value of the t-ratios. $\overline{R}^2$ is the correlation coefficient adjusted for degrees of freedom. SEE is the standard error of the regression. D-h is the Durbin Statistic to test for first-order serial correlation when a lagged dependent variable appears among the regressors.

(2) TSP (Time-Series Computer Programme) is employed in estimating the above equations.

(3) The Ordinary Least Squares Method (OLSQ) is used to estimate the above equations.

(4) Annual data that run from 1967 to 1987 is used to estimate the above equations.

The estimated equations above reveal that the coefficients of the explanatory variables have the expected signs. As we expected the coefficients of the lagged dependent variables of these equations are highly significant. This indicates that the adjustment of the actual money supply (M_3) to the desired level (equilibrium level) is not instantaneous in Saudi Arabia. Moreover, the statistical criteria of these equations, such as the adjustment correlation coefficients (R^2), F-test which is used to test the significance of the correlation coefficient, and Durbin-h statistic (D-h) which is used to detect first order autocorrelation when a lagged dependent appears among the regressors, indicate that the overall fit of these equations is excellent and their performance is very satisfactory. We can see from these equations that except for the commercial banks' claims on the private sector which is found to be statistically insignificant, all other variables (domestic government expenditure and net private sector balance of payments deficit) are found to be statistically significant at the 5 per cent level with very high long-run elasticities (see Table 6.9). The commercial banks' claims on the private sector is excluded from equation no. 1 (see equation no.2). Moreover, equation no. 2 reveals that the exclusion of this variable has no significant effect on the overall goodness of fit of this equation (equation no.2).

In short, the empirical results reveal that the domestic government expenditure and net private sector balance of payments deficits are the most important factors in determining the money supply (M_3) in Saudi Arabia.

Table 6.1 <u>OIL REVENUE, THE FOREIGN ASSET OF SAMA, GOVERNMENT EXPENDITURE</u>
<u>AND MONEY SUPPLY</u>
<u>(In SR billion)</u>

Year	Oil Revenue	Government Expenditure	Foreign Assets	Money Supply $(M_3$
1971	5.346	6.294	2.232	3.137
1972	9.855	8.130	0.046	4.481
1973	12.098	10.159	6.172	6.218
1974	21.110	18.595	23.862	8.731
1975	94.432	32.038	135.857	14.060
1976	86.969	81.784	180.143	24.453
1877	99.507	128.273	106.346	37.336
1978	113.154	138.048	194.469	53.617
1979	116.534	147.971	201.069	61.380
1980	156.406	188.363	276.838	74.789
1981	257.004	236.570	417.765	94.380
1982	333.968	284.648	477.832	119.445
1983	270.579	244.912	438.959	134.398
1984	145.123	230.185	330.107	143.947
1985	121.348	216.363	255.793	148.816
1986	88.425	184.004	260.110	150.240
1987	42.464	137.422	n.a.	160.739

Note: n.a. = not available

Source: SAMA, <u>Annual Report</u>, various issues.

Table 6.2   DOMESTIC GOVERNMENT EXPENDITURE, COMMERCIAL BANKS' CLAIMS ON
THE PRIVATE SECTOR, MONETARY BASE AND MONETARY AGGREGATES
(In SR Million)

Year	M_1	M_2	M_3	MB	GE	CBC
1970	2340	2822	3137	n.a	5417	1667
1971	2610	3175	3518	1981	6290	1759
1972	3261	3998	4481	2674	8130	1780
1973	4747	5561	6218	4872	10160	2398
1974	6510	7483	8731	5940	15000	9514
1975	10684	12223	14060	8582	17900	4514
1976	19570	21142	24453	14596	43100	6722
1976	19570	21142	24453	14596	43100	9884
1977	31217	33028	37336	25897	62000	10118
1978	45297	48357	53617	36294	93400	14484
1979	50486	54651	61380	38308	96700	25861
1980	55647	67177	74789	34196	127700	34919
1981	63407	83403	94380	34075	145600	43148
1982	76588	102955	119445	40552	173300	50535
1983	87043	116093	134398	46137	172100	56201
1984	86321	119897	143948	44900	135400	59315
1985	83111	119700	148896	45768	118900	60423
1986	83039	122721	150239	50054	99800	60247
1987	86381	127350	160739	52730	71700	59464

Key to Abbreviations:

M_1, M_2 and M_3 = the monetary aggregates

MB = the monetary base

GE = the government expenditure

CBC = the commercial banks' claims on the private sector

n.a =not available

Sources:

1.   SAMA, Annual Report, different issues, 1975-1986.
2.   SAMA, Money and Banking Statistics, 1st Quarter 1986
      and 3rd Quarter 1987.

Table 6.3 THE GROWTH RATES OF DOMESTIC GOVERNMENT EXPENDITURE,
COMMERCIAL BANKS' CLAIMS ON THE PRIVATE SECTOR,
MONETARY BASE AND MONETARY AGGREGATES

Year	M_1	M_2	M_3	MB	GE	CBC
1971	11.5	12.5	12.1	n.a	4.4	5.5
1972	25.0	25.9	27.9	35.0	29.2	1.2
1973	45.6	39.1	38.8	82.2	24.9	34.7
1974	38.4	34.6	40.4	21.9	83.1	88.4
1975	62.6	63.3	61.0	44.5	88.4	48.7
1976	83.2	73.0	73.9	70.00	133.4	47.0
1977	59.5	56.2	52.7	77.4	30.5	2.4
1978	45.1	46.4	43.6	40.2	28.5	30.1
1979	11.5	13.0	14.5	5.6	6.7	78.5
1980	10.2	23.1	21.8	-10.7	27.0	35.1
1981	13.2	24.0	26.2	-0.35	24.1	23.5
1982	20.8	23.4	26.6	0.004	22.9	17.1
1983	13.7	12.8	12.5	13.8	-13.5	10.1
1984	-0.8	3.3	7.1	-2.7	-6.0	5.5
1985	-3.7	-o.2	3.4	1.93	-16.1	1.9
1986	-0.1	-2.5	0.9	9.4	-28.2	-0.3

Annual Growth Rate 1971-1986						
	27.3%	27.9%	28.9%	25.0%	27.9%	26.8%
Annual Growth Rate 1971-1982						
	35.6%	36.2%	36.6%	33.4%	41.9%	34.4%
Annual Growth Rate 1983-86						
	2.3%	3.9%	6.0%	5.6%	-15.9%	4.3%

Key to Abbreviations:

M_1, M_2 and M_3 = the monetary aggregates
MB = the monetary base
GE = the government expenditure
CBC = the commercial banks' claims on the private sector
n.a = not available

Sources:
1. SAMA, Annual Report, different issues 1974-86.
2. SAMA, Monetary and Banking Statistics, 3rd Quarter 1987.
3. Saudi Arabian Ministry of Planning, Achievement of Development Plans 1970-1986: Facts and Figures

Table 6.4   NON-OIL GDP, DOMESTIC GOVERNMENT EXPENDITURE, CURRENCY IN
CIRCULATION, DEMAND DEPOSITS, TIME AND SAVINGS DEPOSITS
AND OTHER QUASI-MONETARY DEPOSITS
(In SR Billion)

Year	CC	DD	TS	QM	Y	GE
1971	1.642	0.968	0.563	0.343	8.253	6.29
1972	1.951	1.309	0.738	0.493	9.183	8.13
1973	2.488	2.259	0.814	0.656	11.403	10.16
1974	3.374	3.195	0.914	1.248	15.430	15.00
1975	5.052	5.633	1.539	1.837	28.125	17.90
1976	8.559	11.012	1.572	3.310	47.325	43.10
1977	13.608	17.610	1.811	4.308	67.693	62.00
1978	17.970	27.327	3.060	5.260	89.888	93.40
1979	21.010	29.476	4.165	6.729	107.240	96.70
1980	25.199	30.449	11.630	7.511	130.884	127.70
1981	26.144	37.265	19.444	10.977	152.255	145.60
1982	30.421	46.167	26.367	16.490	184.292	173.30
1983	35.281	51.762	24.050	18.305	205.441	172.10
1984	34.655	51.667	33.575	24.051	210.410	135.40
1985	34.750	48.361	36.589	29.196	201.453	118.90
1986	36.868	46.171	39.682	27.519	187.653	99.80

Key to Abbreviations:
          CC = the currency in circulation
          DD = the demand deposits
          TS = the time and savings deposits
          QM = other quasi-monetary deposits
          Y   = the non-oil GDP at current price
          GE = the domestic government expenditure

Sources:
     1.   SAMA, Annual Report, different issues, 1975-1987.
     2.   SAMA, Money and Banking Statistics, 1st Quarter 1986
          and 3rd Quarter 1987.

Table 6.5 THE GROWTH RATES OF NON-OIL GDP, DOMESTIC GOVERNMENT EXPENDITURE AND THE COMPONENTS OF MONEY SUPPLY M_3

Year	CC	DD	TS	QM	GE	Y
1971	7.4	19.2	17.4	9.0	4.4	6.0
1972	18.4	35.3	30.5	40.6	29.2	7.1
1973	27.5	72.5	10.4	36.0	24.9	12.9
1974	35.6	41.9	12.2	90.1	83.1	15.1
1975	49.7	76.3	68.5	47.2	88.4	13.0
1976	69.4	95.5	2.1	80.2	133.4	19.8
1978	59.0	59.9	15.2	30.1	30.5	16.7
1979	16.9	7.9	36.1	27.9	6.7	11.2
1980	19.9	3.3	179.2	11.6	27.0	11.8
1981	3.8	22.4	71.9	46.1	24.1	12.4
1982	16.4	33.9	39.9	50.2	22.9	11.3
1983	16.0	12.1	10.2	11.0	-13.5	7.0
1984	-1.8	0.2	15.6	31.4	-6.0	5.0
1985	0.3	-6.9	9.0	21.4	-16.1	-2.7
1986	6.1	-4.5	8.5	-5.8	-28.2	-6.6

Annual Growth Rate 1971-86					
23.5%	32.1%	36.7%	34.0%	27.9%	9.7%

Annual Growth Rate 1971-82					
29.7%	42.7%	45.4%	40.9%	41.9%	12.7%

Annual Growth Rate					
5.5%	0.35%	10.8%	14.5%	-15.9%	0.68%

Key to Abbreviations:
    CC = the currency in circulation
    DD = the demand deposits
    TS = the time and saving deposits
    QM = other quasi-monetary deposits
    GE = the domestic government expenditure
    Y = the non-oil GDP

Source: This Table is generated from Table 6.4.

Table 6.6   FACTORS AFFECTING CHANGE IN MONEY SUPPLY (M_3)
(In SR billion).

Year	GE	CBC	NPD
1970	5.417	1.667	-5.255
1971	6.294	1.759	-6.170
1972	8.130	1.780	-7.190
1973	10.159	2.398	-9.040
1974	15.000	4.514	-14.607
1975	17.900	6.722	-14.800
1976	43.100	9.884	-35.800
1977	62.000	10.118	-48.700
1978	93.400	14.484	-84.700
1979	96.700	25.861	-97.700
1980	127.700	34.919	-127.200
1981	145.600	43.148	-146.600
1982	173.300	50.535	-167.300
1983	172.100	56.201	-162.700
1984	135.400	59.315	-141.300
1985	118.300	60.423	-130.600
1986	99.800	60.247	-102.300
1987	71.700	59.464	-85.700

Key to Abbrevations:

GE = the domestic government expenditure
CBC = the commercial banks' claims to the private sector
NPD = the net private sector balance of payments deficits

Sources:

1. SAMA, Annual Report, different issues
   1971-1987
2. Saudi Arabia Ministry of Planning, Achievement of
   Development Plans 1970-1986: Facts and Figures

Table 6.7 <u>THE GROWTH RATES OF THE FACTORS AFFECTING CHANGE IN MONEY SUPPLY (M$_3$)</u>

Year	GE	CBC	NPD
1971	4.4	5.5	17.4
1972	29.2	1.2	16.5
1973	24.9	34.7	25.7
1974	83.1	88.4	60.2
1975	88.4	48.7	1.3
1976	133.4	47.0	141.9
1977	30.5	2.4	36.0
1978	28.5	30.1	73.9
1979	6.7	78.5	15.3
1980	27.0	35.1	30.2
1981	24.1	23.5	15.3
1982	22.9	17.1	14.1
1983	-13.5	10.1	-2.7
1984	-6.0	5.5	-13.2
1985	-16.1	1.9	-7.6
1986	-28.2	-0.3	-16.2

Key to Abbreviations:

GE = the domestic government expenditure
CBC = the commercial banks' claims to the private sector
NDP = the net private sector balance of payments deficit

Source:

This Table is generated from Table 6.6.

Table 6.8 THE RATIOS OF DOMESTIC GOVERNMENT EXPENDITURE, COMMERCIAL BANKS' CLAIMS ON THE PRIVATE SECTOR AND NET PRIVATE SECTOR BALANCE OF PAYMENTS DEFICITS TO MONEY SUPPLY (M_3).

Year	GE/M_3 Ratio	CBC/M_3 Ratio	NPD/M_3 Ratio
1972	1.814	0.399	-1.600
1973	1.634	0.386	-1.454
1974	1.718	0.517	-1.673
1975	1.273	0.478	-1.053
1976	1.763	0.404	-1.464
1977	1.661	0.271	-1.304
1978	1.742	0.270	-1.580
1979	1.576	0.421	-1.591
1980	1.708	0.467	-1.700
1981	1.543	0.457	-1.553
1982	1.451	0.423	-1.401
1983	1.280	0.418	-1.210
1984	0.941	0.412	-0.952
1985	0.795	0.406	-0.877
1986	0.664	0.401	-0.681
1987	0.446	0.370	-0.533

Key to Abbreviations:

GE = the domestic government expenditure
CBC = the commercial banks' claims to the private sector
NPD = the net private sector balance of payments defficit

Note: This Table is generated from using Tables 6.2 and 6.6.

Table6.9   THE LONG- AND SHORT-RUN ELASTICITIES OF DOMESTIC GOVERNMENT
            EXPENDITURE, COMMERCIAL BANKS' CLAIMS ON THE PRIVATE SECTOR
            AND NET PRIVATE SECTOR BALANCE OF PAYMENTS DEFICIT AND THE
            ADJUSTMENT COEFFICIENTS

		SRE	LRE	AC
Equation no. 1				
	GE	0.712	3.115	
	CBE	0.117	0.514	
	NPD	-0.553	-2.419	
				0.229
Equation no. 2				
	GE	0.758	4.892	
	NPD	-0.556	-3.589	
				0.155

Key to Abbreviations:

GE = the domestic government expenditure
CBC = the commercial banks' claims on the private sector
NPD = the net private sector balance of payments deficit
SRE = the short-run elasticity
LRE = the long-run elasticity
AC = the adjustment coefficient

Note:

the long-run elasticity of X (an explanatory variable) = $\dfrac{C}{1-C_a}$

where

C is the short-run elasticity of X and C_a is the estimated
adjustment coefficient (the coefficient of lagged independent
variable).

6.3 THE MONETARY BASE AND MONEY MULTIPLIER IN SAUDI ARABIA

It has been the tradition in analysing the money supply process to begin by expressing the money supply as a product of the monetary base and the money multiplier. The reasons for using such an approach in analysing the money supply can be summarized as follows:

(1) This approach helps separate the impacts which monetary authorities, commercial banks and the non-bank public have on the money supply.

(2) It has been argued by many economists in the U.S. and other developed countries that, in order to achieve good control over the fluctuations in monetary aggregates, the monetary authorities should focus on the monetary base as an intermediate target. This is because of the closeness between fluctuations in the monetary base and those in monetary aggregates (see for example Burger 1975, Davis 1979/1980 and Davidson and Hator 1983).

6.3.1 The Saudi Monetary Base

In the last two decades, the monetary base has received a great deal of attention in the money-supply literature. This may be attributed to two main factors:

Firstly, there has been a growing belief among many economists (see, for example, Boorman and Havrilesky 1972, Burger 1975, Davis 1979/1980 and Barnett 1980), that the monetary aggregate exerts an important causal effect on prices and the level of economic activity. Hence the importance of the monetary base emerges from the fact that a close relationship exists between the monetary base and the monetary

aggregates.

Secondly, as we have previously mentioned, the question of the ability of a central bank to control the monetary aggregates by concentrating on the monetary base as an intermediate target has attracted a great deal of attention in the U.S. and other developed countries over the last two decades. This can be attributed at least partially to the growing number of economists holding the view that monetary management should focus on the monetary aggregates because of the allegedly close relationship between such aggregates and nominal measures of economic activity such as the GNP. It then becomes a question of choosing a monetary aggregate as an intermediate tool of policy which can indeed be controlled by the Central Bank and at the same time be closely related to the nominal GDP.

Let us now try to shed some light on the monetary base in Saudi Arabia. Burger (1971) defined the monetary base as the net monetary liabilities of the monetary authorities held by the commercial banks and non-bank public. On a balance sheet of the monetary authorities, the monetary base will appear as liabilities in money form which consist of deposits of commercial banks in the Central Bank as well as currency and coins held by the public. Generally speaking, the monetary base can be defined as the commercial banks' reserves with Central Bank plus currency held by the public, i.e.

$$MB = C + R$$

In the cause of Saudi Arabia, the banks' reserves with SAMA consist of current deposits, statutory deposits and other deposits of the commercial banks which are mainly the bankers' security deposits (see Table 6.10). These deposits and currency and coins held by the public appear as liabilities on the SAMA balance sheet. Table 6.10 indicates that the Saudi monetary bases' components increased substantially between 1970 and 1983. Moreover, Table 6.3 shows that

during the 1971-1982 period the monetary base in Saudi Arabia registered a very high annual growth rate.

An important question which should be answered here is 'What determines the monetary base in Saudi Arabia?' To answer this question, we should make a distinction between the factors determining the monetary base which are usually called 'sources', and the ways in which the base is allocated which are usually called 'uses'. We earlier defined the monetary base as the reserves of commercial banks plus currency in the hands of the public. This means that we are actually looking at the allocation of the base between alternative uses. These uses do not tell us much about the factors which determine the size and behaviour of the monetary bases. It is the sources which need to be studied in order to determine and understand the size and behaviour of the monetary base. In the United States, for examples, the sources of the monetary base, which can be obtained from the consolidated balance sheet of the Federal Reserve bank, are usually used to determine the size and behaviour of the monetary base. These sources, according to Chatah 1983 and Al-Saati 1986, are defined as being equal to the sum of Federal Reserve credit which consists of Federal Reserve holdings of United States government securities, acceptances, discount and advances and float, plus cash, gold certificates and special drawing rights certificates. Besides Federal Reserve bank assets, the Treasury can affect the monetary base by increasing its outstanding currency which is used as a reserve by depository institutions, i.e. commercial banks. Thus, the Treasury, as well as the Federal Reserve bank's consolidated balance sheets are used to determine the size of the monetary base in the United States.

So much for the monetary base's sources in the United States. Let us now highlight the Saudi monetary base's sources. These can be

divided into positive and negative sources:

1. Foreign Assets:

As we previously mentioned, oil revenues constitute the predominant source of foreign exchange in Saudi Arabia. Since these revenues are received directly by SAMA, they produce an equal increment in SAMA's foreign assets holdings. These foreign assets are held in two main forms - foreign exchange and foreign bonds which are mainly U.S. government bonds purchased directly from the Federal Reserve. Apparently, the export produce increments in SAMA's foreign assets in turn increase the monetary base and domestic liquidity in Saudi Arabia. On the other hand, the imports have a negative effect on the monetary base and domestic liquidity. Since the Saudi importers have to pay for their imports with foreign exchange which is bought from commercial banks (the commercial banks in Saudi Arabia buy their foreign exchange from SAMA), SAMA's foreign assets will decline which will reduce the monetary base and domestic liquidity. Moreover, international capital flows (capital inflow and outflow) have the same effect as exports and imports on the monetary base and domestic liquidity. Table 6.3 and 6.11 show that foreign assets and the monetary base increased substantially during 1975-1983 when oil prices increased sharply. In short, foreign assets have a positive effect on the monetary base and domestic liquidity in Saudi Arabia.

2. Government Deposits:

Government revenues, which comes mainly from oil revenues, are usually kept in SAMA as government deposits and thus increase the level of government deposits, while government expenditures cause a depletion of these deposits. This means that if the Saudi government uses one of its accounts and demands currency from SAMA to pay for a project, then the Banking Department in SAMA will reduce that government account by

that amount and transfer an equal amount of foreign exchange to the Issue Department which will issue currency equivalent to the amount which is paid to the government by the Banking Department. This process increases the Saudi monetary base by the amount paid to the non-bank public by the government. This implies that government deposits have a negative influence on the monetary base in Saudi Arabia.

Generally speaking, changes in the volume of government deposits in SAMA follow closely the government's fiscal position in any particular year. Tables 6.2, 6.3 and 6.11 show that during 1975-1980, government deposits and monetary deposits followed an increasing trend in Saudi Arabia.

3.   Other Sources:

In addition to the sources mentioned above, there are other sources such as coins, gold, the reserve fund and other net liabilities of SAMA (see Table 6.11). Coins and gold are positive sources of the Saudi monetary base. Table 6.11 shows that coins' size in Saudi Arabia is very small relative to the size of the monetary base. It also indicates that gold shows little change over time. Moreover, the reserve fund and other liabilities of SAMA are negative sources of the Saudi monetary base.

6.3.2 Controllability of the Monetary Base in Saudi Arabia

In the last two decades, the issue of the ability of the Central Bank to control the monetary base has received a great deal of attention in the U.S. and other developed countries. This could be attributed to the following facts, as mentioned earlier:

Firstly, many economists agree that there may be a close

relationship between the behaviour of the monetary base and the behaviour of monetary aggregates (see, for example, Burger 1971 and Davis 1979/1980).

Secondly, a growing number of economists hold the view that the policy- makers should focus on the monetary aggregates as intermediate targets, since they may have a close relationship with inflation and the nominal measures of economic activity such as GDP. Hence, it is essential to control the monetary base in order to use the monetary aggregates effectively as intermediate targets.

Let us now discuss the controllability of the monetary base in Saudi Arabia. In order to carry out this discussion, the following question should first be answered: 'What are the policy tools available to SAMA?' SAMA has only one primary monetary policy tool, the reserve requirement ratio, and several secondary monetary policy tools, such as, sales of forward dollar, swaps and placements of funds on behalf of Saudi government agencies in commercial banks. In 1983, SAMA took the first step towards creating a fixed-interest securities market, when it introduced a Riyal market instrument called Banker's Security Deposit Accounts (BSDA). The aim of this instrument is to increase SAMA's control over the money supply and Riyal interest rate and to provide risk-free domestic assets for the public.

SAMA has used the straightforward mechanism of selling forward foreign exchange (mainly U.S. Dollars) against Riyals to banks seeking to cover their position or their customers' positions, thus relievingk pressure on the Saudi Riyal's liquidity. By buying and selling foreign exchange, SAMA has been able to increase or decrease the commercial banks' reserve which in turn expands or contracts the monetary base to the desired level.

Swaps is another secondary policy tool that has been used

effectively by SAMA to create temporarily the Saudi Riyal's liquidity through buying Dollars 'spot' and selling them back 'forward' to banks for a specific period of time. This affects the commercial banks' excess reserve which in turn affects the monetary base.

SAMA can simply place funds with domestic banks on behalf of various government agencies at times of market disruption and, by moving funds to or from the commercial banks, SAMA can increase or decrease the monetary base. According to Chatah (1983), the degree to which this tool has actually been used cannot be directly determined from published data or SAMA's reports. It should be pointed out that the size of government deposits in commercial banks is small relative to the government accounts with SAMA. Moreover, the only time SAMA used this tool effectively was in 1980, when it increased the government deposits in commercial banks from about SR 1 billion (see Chatah 1983 and Al-Saati 1986). This was due to a domestic liquidity crunch which resulted mainly from high international interest rates. Again, by increasing or decreasing the government deposits with commercial banks, the monetary base will increase or decrease.

SAMA could bring about a direct and significant change in the monetary base by altering the reserve requirement ratio. This tool, however, has seldom been used. As we previously noted, SAMA did not use the reserve requirement tool until 1959, seven years after it was established. In late 1979 SAMA again used it in an attempt to encourage the commercial banks to extend more longer-term loans. It reduced the reserve ratio for demand deposits from 15 to 12 per cent and then to 7 per cent in February 1980, along with a similar reduction in the required time deposit reserve ratio (recently, the required time deposits reserve ratio was 2%). It should be mentioned here that despite these significant reductions in the required demand and time

Table 6.10   THE COMPONENTS OF THE SAUDI MONETARY BASE
                    (In SR Million)

Year	CB 1	CDS 2	SDS 3	ODS 4	CP 5
1970	59	73	108	n.a	n.a
1971	63	152	124	n.a	1641.6
1972	69	479	175	n.a	1951.2
1973	117	1784	483	n.a	2487.8
1974	156	1560	850	n.a	3374.4
1975	248	2030	1252	n.a	5051.6
1976	441	3024	2572	n.a	8558.5
1977	721	4535	7033	n.a	13607.7
1978	814	6429	11081	n.a	17969.6
1979	1181	4651	11466	n.a	21009.6
1980	1259	4034	3704	n.a	25198.8
1981	1302	3650	2979	n.a	26143.8
1982	1520	4779	3862	n.a	30421.1
1983	1595	4103	5158	n.a	35280.6
1984	1649	2484	4492	1620	34654.9
1985	1439	2009	4561	3009	34749.8
1986	1281	1097	4610	6198	36867.8
1987	1253	834	4877	6959	38812.4

Key to Abbreviations:

    CB = the currency held by commercial banks (cash in vault)
    CDS = the current deposits with SAMA
    SDS = the statutory deposits with SAMA
    ODS = other deposits with SAMA (Banking Security Deposit
Accounts)
    CP = the currency in hand of non-bank public
    n.a = not available

    The commercial banks' total reserve = 2 + 3 + 4

Sources:
    1.   SAMA, Annual Report, various issues.
    2.   SAMA, Money and Banking, 3rd Quarter 1987.
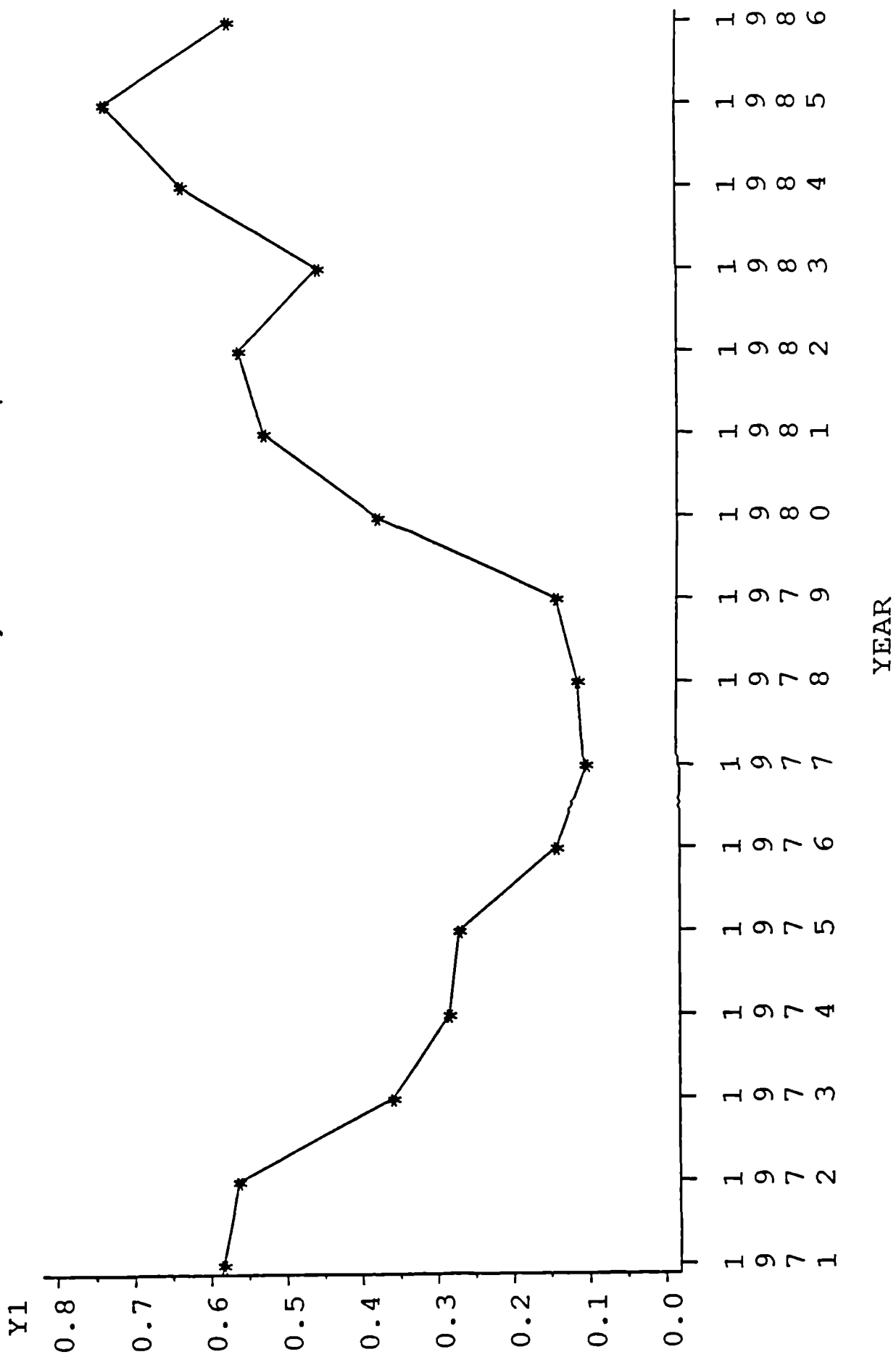
Table 6.11   THE SOURCES OF THE SAUDI MONETARY BASE
                         (In SR Million)

Year	Foreign Assets	Gold	Coins	Government Deposits	Other Net Liabilities
1975	135857	548	21	121600	13546
1976	180143	546	26	125300	33136
1977	106346	548	30	106130	42557
1978	1945469	756	39	82236	63312
1979	201069	750	47	69794	69795
1980	276837	756	52	137787	70817
1981	417765	756	59	262645	79333
1982	477832	756	67	323573	95549
1983	438954	756	83	279269	91366
1984	330107	756	60	258623	95697
1985	255793	756	57	231536	37266
1986	260110	756	67	153669	70247

Sources: SAMA, Annual Report, various issues.

Note: The sources of the Saudi monetary base are obtained from
            SAMA's balance sheets.

Figure 6.1 The Ratio of Currency to Demand Deposits

YEAR

Figure 6.2 The Ratio of Time Deposits to Demand Deposits
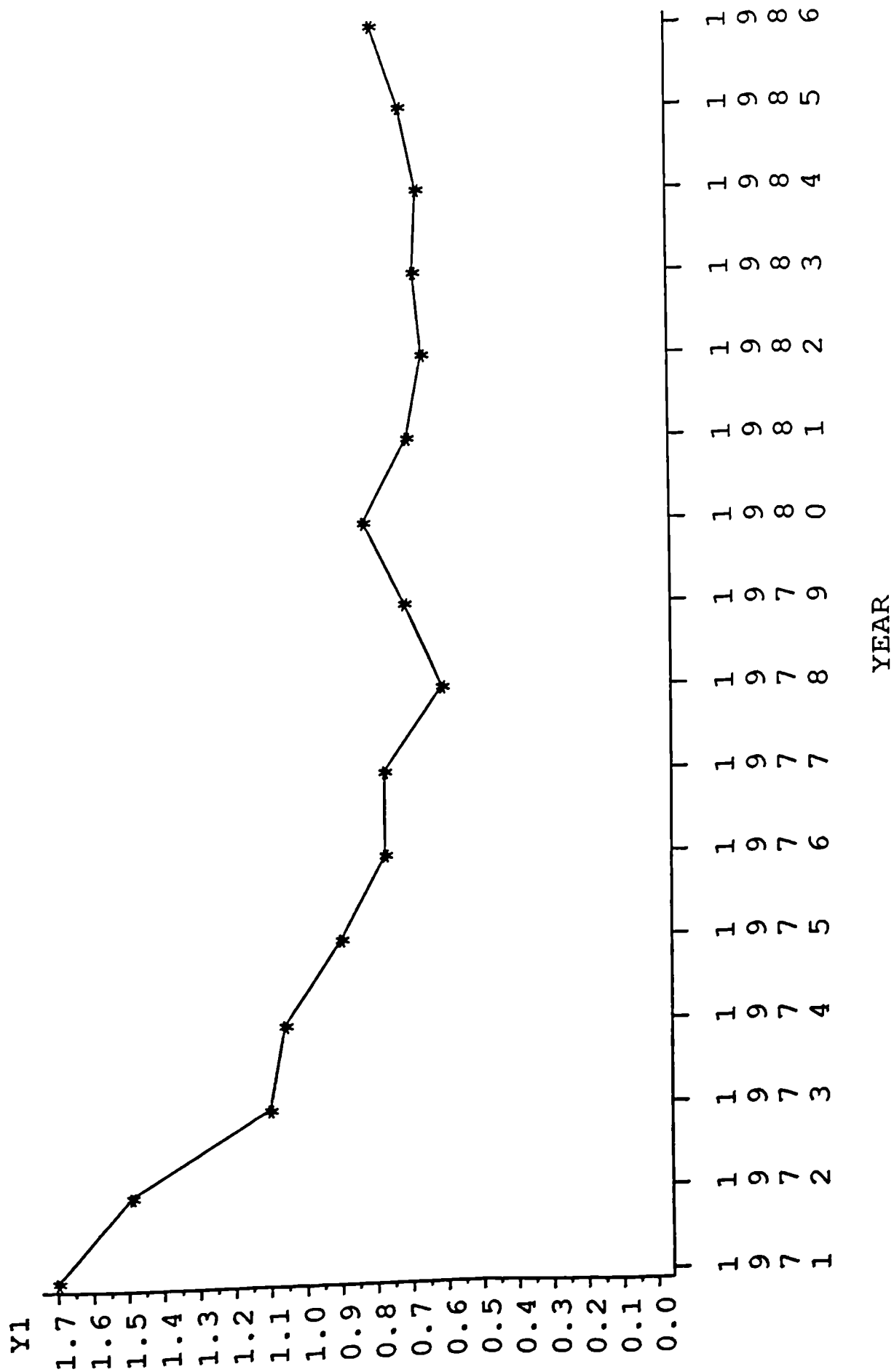
Figure 6.3 The Saudi Money Multiplier of M1
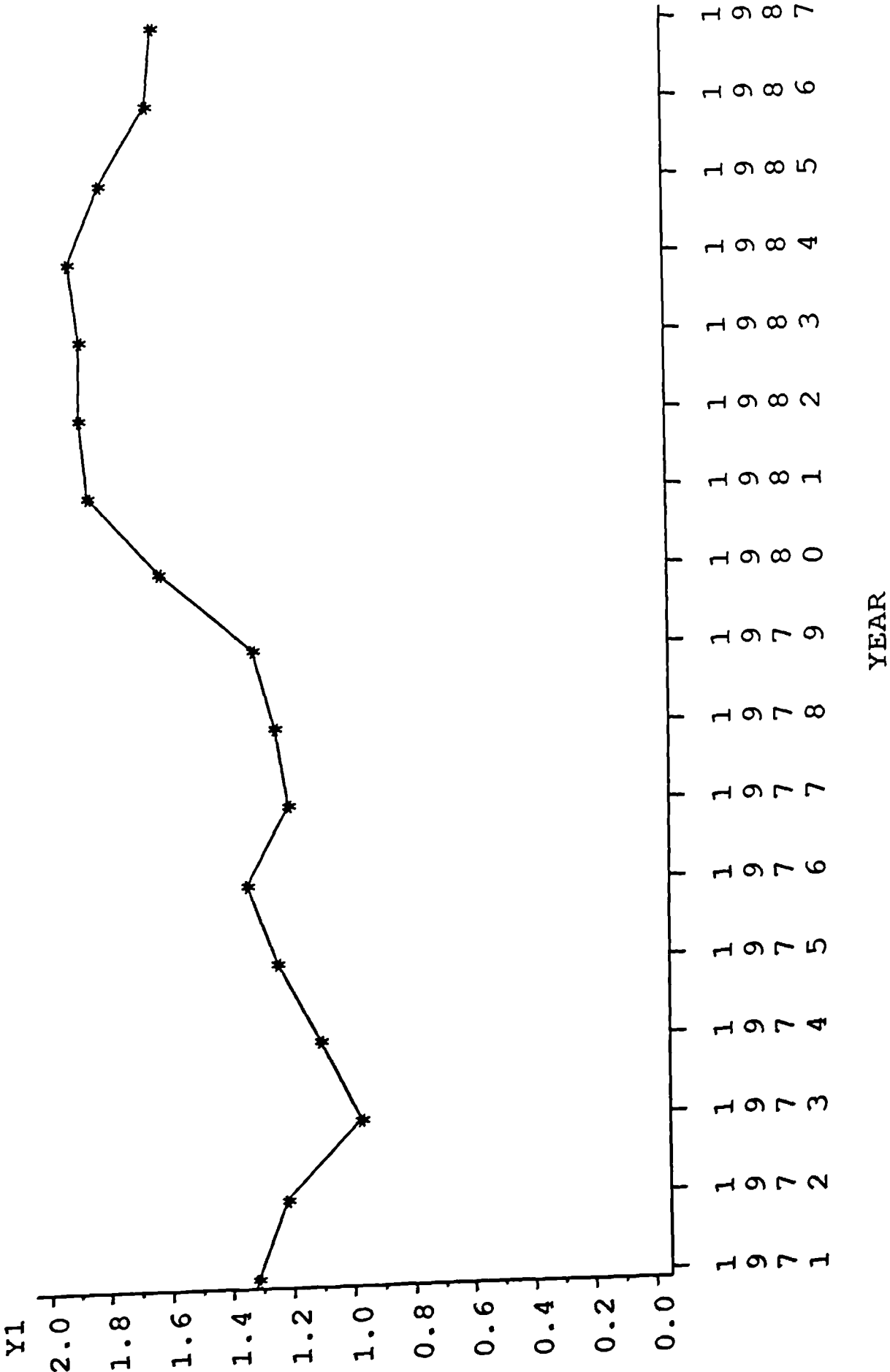
Figure 6.4   The Saudi Money Multiplier of M2

Figure 6.5 The Saudi Money Multiplier of M3

269
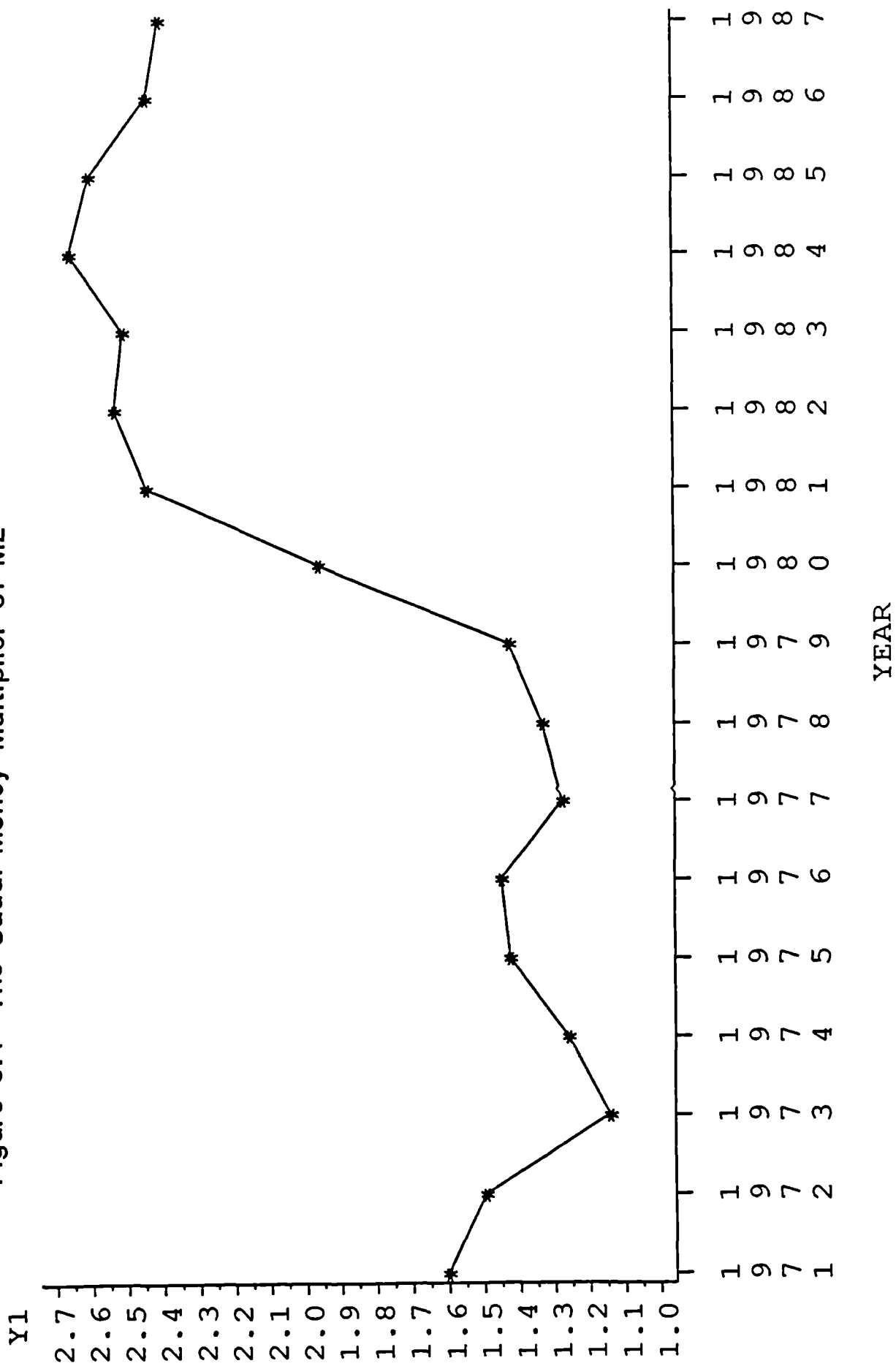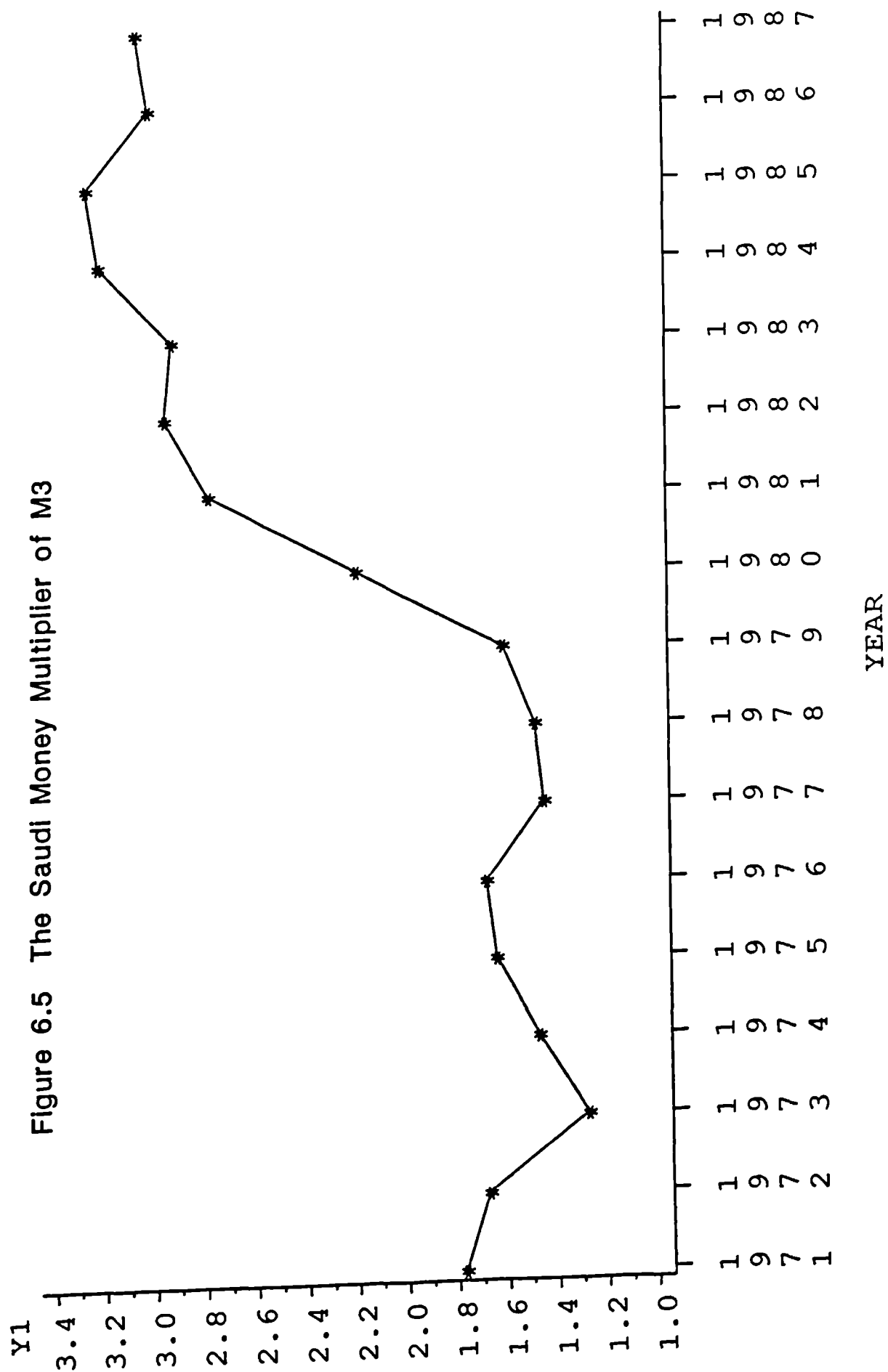
Figure 6.6 The Growth Rates of Saudi Monetary Base
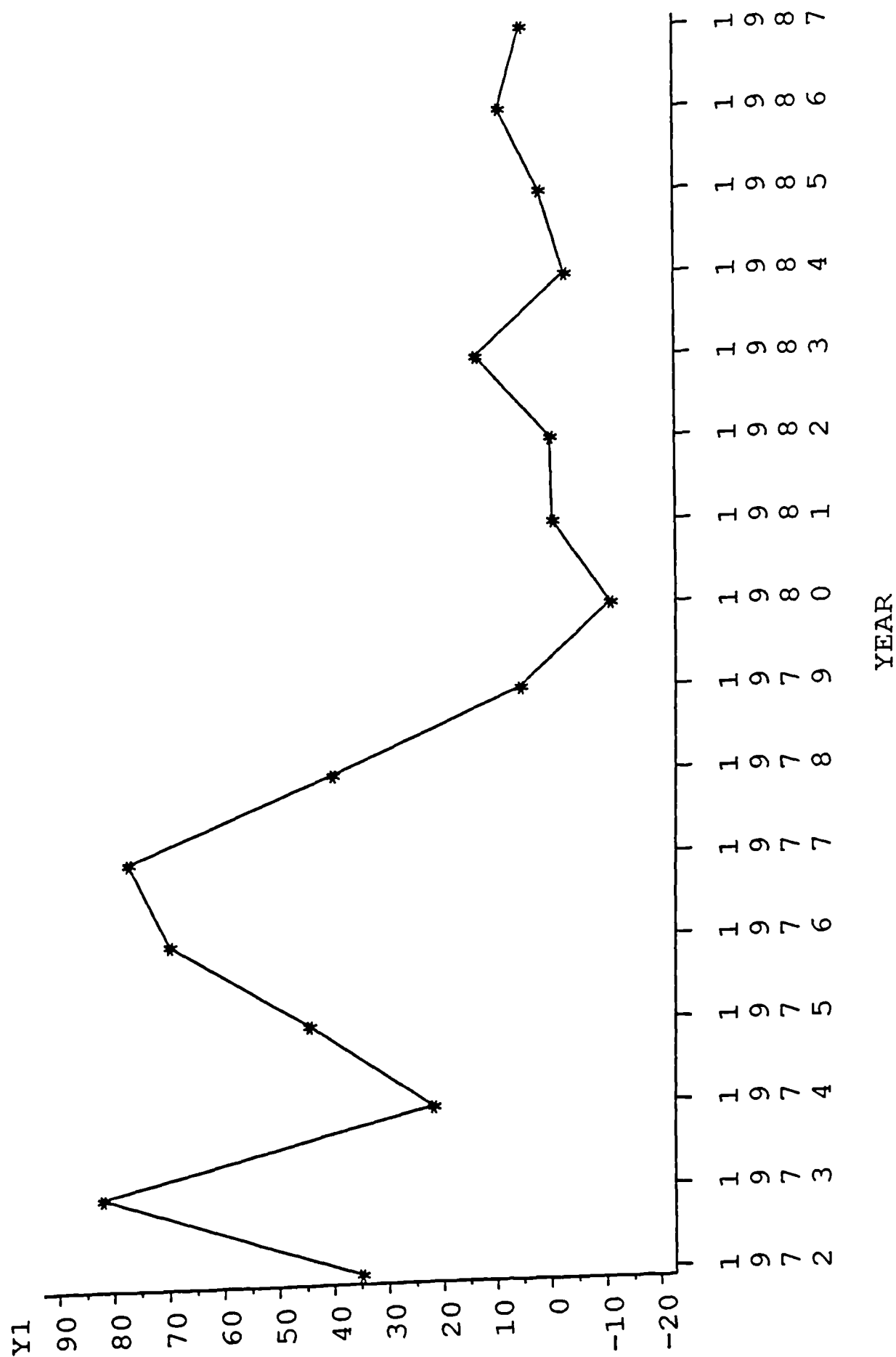
Figure 6.7   The Growth Rates of Saudi Money Supply (M3)
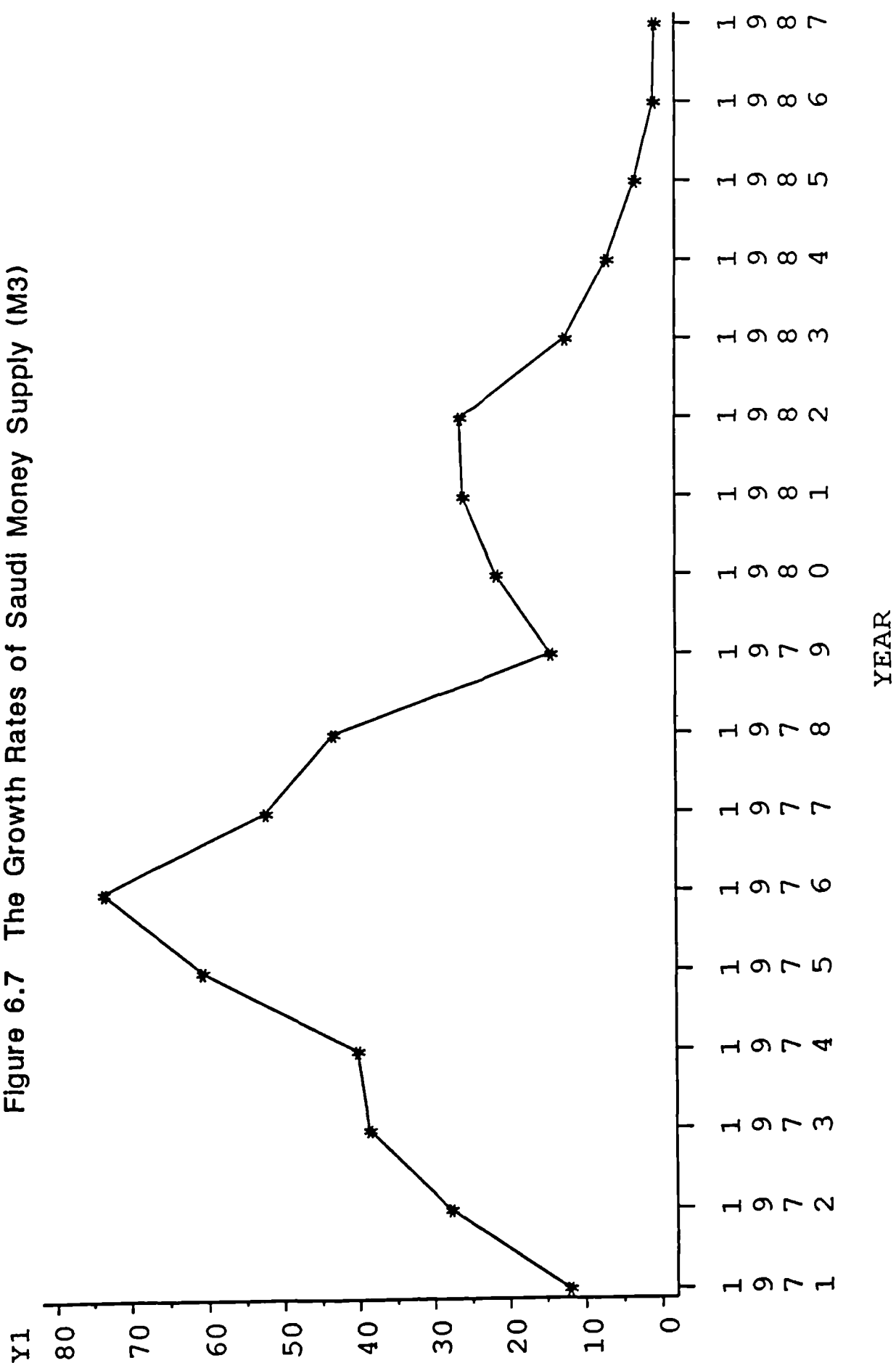
deposits reserve ratios, the commercial banks' claims on the private sector showed a decreasing growth rate after 1980 (see Table 6.7). In addition, there have been no essential changes in the short-term credit share of the commercial banks' total credit. It seems, therefore, that this tool has not been effective in stimulating the commercial banks to extend long-term or even mid-term credit to the private sector.

6.3.3 The Saudi Money Multiplier

As we previously mentioned, the money-supply equation can be expressed as a product of two components: the monetary base and the monetary multiplier. We have already discussed in detail the monetary base in Saudi Arabia. In this section, an attempt will be made to derive the money multiplier for Saudi Arabia taking into account alternative definitions of money, as well as reserve and liquidity laws practised in Saudi Arabia. The derivations of multiplier are more or less standard ones in discussions of the money-supply process and can be found with minor variations throughout the money-supply literature. Before formulating the money multipliers for M_1, M_2 and M_3, it is important to highlight the main laws and practices which govern commercial bank portfolio and reserve behaviour:

1.   Banks must keep a fraction of their demand and time deposits as reserves with SAMA at all times. Since 1980, the required reserve ratio of demand and time deposits have been 7% and 2% respectively.

2.   Banks must keep a certain fraction (currently 20%) of all their deposits in liquid form. Such liquid assets must be in cash, gold or assets which can be converted into cash within a period not exceeding 30 days.

3.   The deposit liabilities of any bank may not exceed 15 times its reserves and paid-up capital. If this limit is exceeded, the bank must within one month either increase its capital and reserves to the prescribed limit or deposit 50% of the excess with SAMA. Banks are usually allowed to increase their capital to meet this requirement. SAMA, however, can use this tool as an alternative to required reserve ratios by denying banks permission to increase their capital, which it did in 1972-73, thus causing the total reserve ratio to increase.

Let us now try to formulate a money multiplier for alternative money-supply definitions in Saudi Arabia. As we mentioned earlier the monetary base can be expressed as:

$$MB = R + C$$

where
       R = total commercial bank reserves
       C = currency held by the public
R can also be expressed as a fraction (r) of total deposits
       (demand [D] and time [T] deposits),
$$R = r(D + T)$$
   Thus $$MB = C + r(D + T)$$

If we define $K = \dfrac{C}{D}$; $t = \dfrac{T}{D}$; $q = \dfrac{Q}{D}$

where, Q is other quasi monetary deposits,
then the monetary base can be expressed as follows:
$$MB = r(D + tD) + KD$$
$$\text{or} \quad MB = D[r(1 + t) + K]$$

and hence, $$D = MB\left[\frac{1}{r(1 + t) + K}\right]$$
If the money supply is defined as $M_1 = C + D$,

   i.e. $M_1 = D(1 + K)$,

   then, $$M_1 = MB\left(\frac{1 + K}{r(1 + t) + K}\right)$$

Alternatively,

   if the money supply is defined as M_2,

      i.e. $M_2 = D(1 + K + t)$,

   then, $$M_2 = MB\left(\frac{1 + K + t}{r(1 + t) + K}\right)$$

Alternatively,

   if the money supply is defined as M_3

   then, $$M_3 = MB\left(\frac{1 + K + t}{r(1 + t + q) + K}\right)$$

An important point to mention here is that since banks are required to keep reserves for demand and time deposits only, the required reserves for quasi-money will be equal to zero and the ratio for quasi-money deposits to demand deposits (q) should be included in the numerator of the money multiplier of M_3.

6.3.4 The Effect of Non-Bank Public, Banks, and SAMA's Behaviour on the Money Multipliers

In order to analyze the behaviour of the money multiplier, it is important to understand the behaviour of the following sectors: banks, the non-bank public and the monetary authority. In the remainder of this section, we will try to throw some light on the behaviour of these sectors and their influence on the money multiplier:

1. THE NON-BANK PUBLIC:

Khakofa (1985) stated 'the ratios K (currency held by the public-demand deposits ratio) and t (time-deposits-demand deposits ratio) are basically influenced by the public's portfolio behaviour in choosing the kind of asset forms in which to hold their income or wealth. We will briefly discuss the factors affecting these ratios in Saudi Arabia.'

(a) The K Ratio:

Chatah (1983) stated 'In the case of the K ratio, the pecuniary costs and benefit involved in choosing between currency and demand deposits, only the service charge on those deposits, would be included as a negative return. This however, is of minor importance and is

dominated by non-pecuniary elements.'

In Saudi Arabia, as in other developing countries, currency is superior to demand deposits in terms of its general acceptability. This means that the currency is generally more acceptable than cheques as a form of payment where familiarity with using cheques as a means of payment is relatively recent. However, the substantial economic and monetary development in Saudi Arabia during the last two decades has led to the following:

Firstly, the public has become much more familiar with banking institutions in general and the use of cheques in particular. This may largely be due to the fact that the number of Saudi commercial banks and their branches has increased substantially (the branches of Saudi commercial banks increased from 70 in 1975 to 676 in 1987) and these branches have proliferated into areas of the country which had been completely unfamiliar with banks and banking services. Furthermore, the Saudi commercial banks have been steadily upgrading their banking services with fully automated back-office support, an integrated branch network and expanded dealing staff.

Secondly, the substantial economic development which the Saudi economy has experienced has brought about a shift towards large businesses and activities involving large money transactions and with it a preference for using cheques instead of currency. In short, the K ratio in Saudi Arabia is basically influenced by the income which represents the level of economic development; inflation, which represents the degree of substitution between money and real assets; and the degree of monetization in the economy. Apparently these factors have a negative impact on the K ratio. Table 6.12 and Fig. 6 .1 show that the K ratio in Saudi Arabia has declined steadily, reflecting the substantial economic development, the increasing degree of monetization

in the Saudi economy, and the declining rate of inflation.

(b)   The t Ratio (time deposits-demand deposits ratio):

This ratio is basically affected by the following factors:

(1)   Income (or wealth): As we previously mentioned, a positive relationship exists between income and all types of deposits. Tables 6.4 and 6.5 show that during 1971-1982 the income (non-oil GDP) and all types of deposits in Saudi Arabia followed an upward trend. Chatah (1983) pointed out that a positive relationship between income and all types of deposits should be expected to hold. However, there is no reason to believe that the income elasticities of demand and time deposits are going to be equal. In fact, the upward trend in t in the U.S., for example, is consistent with the assumption that time deposits can be considered a 'luxury' item with a higher income elasticity than demand deposits. This is true in the case of Saudi Arabia. Our empirical findings (see chapter V) reveal that the short- and long-run income elasticities of time deposits are higher than the short- and long-run income elasticities of the demand deposits in Saudi Arabia.

(2)   The Time Deposits' Interest Rate: It is clear that the higher the rate obtainable on time deposits, the larger the t ratio should be expected to hold. Table 6.13 shows that the t ratio in Saudi Arabia registered high levels during 1980-1986 when Riyal interest rates recorded noticeably high levels.

(3)   The Rates of Return on Other Financial Assets: Obviously, if yields of other financial assets increase, people will be expected to reduce their holdings of each type of deposit, but not proportionately. A larger percentage change will occur in time deposits than in demand deposits.

(4) Given the fact that Saudi Arabia has an open economy with complete capital mobility and that financial investment opportunities are limited to two types (time deposits and shares), one would expect that the international financial assets' yields could have a significant influence on the time deposits and the t ratio.

(5) Attitude towards Time Deposits: A large segment of the Saudi population holds a negative attitude towards time deposits. However, there is increasing evidence that this attitude is changing towards acceptance of time deposits as an appropriate domestic financial saving. During 1971-1986, time deposits increased at a very high annual level of 36.7% (see Table 6.5).

2. BEHAVIOUR OF BANKS:

Commercial bank portfolio decisions affect the value of the money multipliers directly by influencing the reserve ratio (r). It is important to remember that this ratio consists of two parts, the first part attributed to the legal reserve requirements of SAMA, the second part caused by commercial bank holdings of cash and deposits with SAMA over and above the legal reserve requirement. As we all know, the reason for any commercial bank to hold excess reserves is that the bank as a profit maximizer will hold excess reserves at the level where the net marginal revenue on those reserves is zero. Khalofa (1985) indicated that this marginal revenue can be seen as the difference between the yields and the cost of holding increments of excess reserves. The cost is mainly the foregone interest on those funds which would have been received from investment or loan. Chatah (1983)

indicated that while excess reserves do not bring direct returns to the bank, they do, however, perform a service in reducing the risk of the bank being caught short of the liquidity necessary for cheque clearing and currency withdrawal. This risk of liquidity shortage is probably higher in Saudi Arabia than in many other countries since commercial banks cannot borrow from SAMA during a liquidity shortage.

The liquidity requirement by SAMA (required reserve by SAMA) is an essential explanation for the high excess reserve ratio in Saudi Arabia. As previously mentioned, since every bank is required to maintain a liquid reserve of not less than 20% of its deposit liabilities, such reserve being in cash, gold, or assets which can be converted into cash within a period of thirty days, it is feasible to believe that in meeting that requirement banks are induced to keep a larger volume of excess reserves than they would in the absence of such a requirement.

Khalofa (1985) indicated that in Saudi Arabia the excess reserve ratio is both high and volatile. We have already mentioned some factors which lead us to expect a high reserve ratio (r) in Saudi Arabia. The volatility of the ratio is partly due to the liquidity requirement mentioned above. Vault cash and deposits with SAMA are only two ways of meeting that requirement (see Table 6.10). Banks can hold, for example, relatively liquid foreign assets. Hence any change in the liquidity portfolio of the bank will cause a change in e ratio (excess reserve ratio). Another possible reason for the volatility of the e ratio is the requirement that banks keep 50% of any deposits in excess of 15 times their capital as a reserve with SAMA. This implies a continuous shift of commercial bank deposits with SAMA between statutory reserves and excess reserves. A third possible cause of the volatility in e ratio is the magnitude of social and economic change that has taken

place in Saudi Arabia during the period and the volatility of expectations under such conditions.

3.   SAMA's BEHAVIOUR:

SAMA can affect the money multipliers directly by changing the required reserve ratios which are the only primary tools available to it. However, SAMA took the first step towards creating a fixed interest securities market when, over the past few years, it introduced a Riyal market instrument called Banker's Security Deposit Account (BSDA) offered to domestic banks on a discount basis. The aim of the BSDA scheme, as we previously mentioned, is to increase SAMA's control over the money supply and the Riyal interest rate and to provide risk-free domestic assets for the commercial banks. The scheme was started with 91-day non-negotiable and non-transferable BSDAs. The banks eventually succeeded in securing a better interest rate for BSDAs and the right to trade them. SAMA later introduced 180-day and 30-day BSDAs in April 1985 and September 1985, respectively. SAMA offers these BSDAs on a weekly basis in an aggregate amount of SR900 million for one month, and SR500 million for three months and six months each. During 1986, SAMA began offering repurchase facilities against collateral of its BSDAs. Moreover, the rates on these instruments have been slightly improved. Undoubtedly, this instrument will influence the commercial banks' investment portfolio and the excess reserve ratio.

Let us return to the required reserve ratio. As we previously mentioned, since 1963 SAMA has changed the required reserve ratios on only four occasions. Three of these changes took place after 1976. In May 1976, the ratios were increased as a measure of monetary restraint

Table 6.12

THE GROWTH RATES OF NON-OIL GDP, THE RATES OF INFLATION, THE NUMBER OF COMMERCIAL BANKS AND THE RATIOS OF CURRENCY TO DEMAND DEPOSITS

Year	K	N.GDP	N.CB	Inf.
1971	1.700	6.0	66	4.86
1972	1.490	7.1	67	4.30
1973	1.100	12.9	68	13.90
1974	1.056	15.1	69	21.50
1975	0.897	13.0	70	34.70
1976	0.772	19.8	87	31.5
1977	0.773	16.9	93	11.20
1978	0.610	14.5	110	11.20
1979	0.713	11.2	140	1.90
1980	0.828	11.8	259	3.60
1981	0.702	12.4	297	2.90
1982	0.659	11.3	397	1.12
1983	0.682	7.0	488	0.80
1984	0.671	5.0	560	-1.20
1985	0.719	-2.7	597	-3.20
1986	0.798	-6.6	628	-3.00

Key to Abbreviations

K = the ratio of currency held by non-bank public to demand deposits.
N.GDP = The growth rate of non-oil GDP
N.CB = the number of commercial banks' branches
Inf = the inflation rate

Sources:

SAMA, Annual Report, various issues.
SAMA, Money and Banking, 3rd quarter 1987.

Table 6.13 THE GROWTH RATES OF NON-OIL GDP, THE RATE OF INFLATION, RIYAL
AND US DOLLAR INTEREST RATE AND THE RATIOS OF TIME DEPOSITS
TO DEMAND DEPOSITS.

Year	t	N.GDP	Dr	Fr	Inf
1971	0.587	6.0	n.a	n.a	4.86
1972	0.564	7.1	n.a	n.a	4.30
1973	0.360	12.9	n.a	n.a	13.90
1974	0.286	15.1	n.a	n.a	21.50
1975	0.273	13.0	6.00	6.21	34.70
1976	0.143	19.8	6.00	6.61	31.50
1977	0.103	16.9	4.50	6.91	11.20
1978	0.112	14.5	4.90	9.78	11.20
1979	0.141	11.2	8.72	11.67	1.90
1980	0.382	11.8	12.84	14.08	3.60
1981	0.537	12.4	14.13	15.83	2.90
1982	0.571	11.3	12.56	13.36	1.12
1983	0.465	7.0	10.13	10.22	0.80
1984	0.650	5.0	10.10	11.72	-1.2
1985	0.756	-2.7	9.13	8.84	-3.2
1986	6.589	-6.6	7.78	6.60	-3.0

Key to Abbreviations:

t = the ratios of time deposits to demand deposits
N.GDP = the growth rate of non-oil GDP
Dr = short term Riyal interest rate
Fr = short-term US Dollar interest rate
Inf = the inflation rate
n.a = not available

Source: SAMA, Annual Reports, various issues.
The US Dollar interest rate is obtained from the
Central Statistical Office U.K. (CSO). The Riyal
interest rate is obtained from SAMA.

Table 6.14 the Saudi Money Multipliers of M_1, M_2 and M_3

Year	MM_1	MM_2	MM_3
1971	1.317	1.603	1.776
1972	1.219	1.495	1.676
1973	0.974	1.142	1.276
1974	1.106	1.260	1.470
1975	1.245	1.424	1.638
1976	1.341	1.448	1.675
1977	1.205	1.275	1.442
1978	1.248	1.332	1.477
1979	1.318	1.427	1.602
1980	1.627	1.964	2.187
1981	1.861	2.448	2.770
1982	1.889	2.539	2.945
1983	1.887	2.516	2.913
1984	1.923	2.670	3.206
1985	1.816	2.615	3.253
1986	1.659	2.452	3.000
1987	1.638	2.415	3.048

Key to Abbreviations:

MM_1 = the money multiplier of M_1

MM_2 = the money multiplier of M_2

MM_3 = the money multiplier of M_3

Note: The figures of the money multipliers of M_1, M_2 and M_3 are obtained from using the formulae in section 6.3.2.

in an attempt to reduce inflation. In May 1979 and in February 1980, that policy was reversed. This was because inflation had declined and the credit restraint was keeping the interest rate at a high level. The increase in the required reserve ratio in 1976 did not produce an absolute increase in the total reserve ratio (r) (Chatah 1983). In fact the total reserve ratio dropped from 0.52 to 0.44 between the end of 1975 and the end of 1976. While this in itself does not necessarily mean that the ratio would not have dropped even further in the absence of the policy, it does show that when a large excess reserve ratio is held by commercial banks, the effectiveness of monetary restraint by raising the required reserve ratios is very much diluted.

SAMA could use two other ways to influence the r ratio (reserve ratio) and the money multipliers in Saudi Arabia:

(1)   By changing the liquidity requirement and thus influencing e (excess reserve ratio).

(2)   By changing the volume of government deposits in commercial banks.

CONCLUSION

Our empirical findings in this chapter reveal that the domestic government expenditure and net private sector balance of payments deficit exert a significant influence on the money supply in Saudi Arabia. Both are found to be statistically significant (at the 5 per cent level) with high long-run elasticities (+4.89 and -3.59 respectively). These empirical findings confirm that the Saudi domestic government spending, even with a budget surplus, has been a very effective fiscal policy (because the government revenue in Saudi Arabia

comes almost exclusively from abroad, rather than from domestic sources such as taxes) in determining the growth of money supply and in controlling inflation in Saudi Arabia. As we previously mentioned, the monetary policy has a limited effect on the money supply and price levels. However, it can play an important role in smoothing the day-to-day or week-by-week fluctuations of the money supply. This can be done through the monetary policy tools which are available to SAMA, such as the required reserve ratio, sale of forward Dollar, swaps, placements of funds on behalf of Saudi government agencies and bankers' security deposit accounts. Finally, the net private sector balance of payments deficit has been the major reason for depletion of the domestic liquidity in Saudi Arabia.

In our discussion of the monetary base in Saudi Arabia, we indicated that this consists of the following components: currency held by the public (currency held by commercial banks and non-bank public), current deposits with SAMA (free reserve with SAMA), statutory deposits (required reserve with SAMA) and other deposits with SAMA (mainly the bankers' security deposit accounts). We have also shed some light on the sources which determine the size of the monetary base in Saudi Arabia. These sources fall into two groups: the first consists of the positive sources which are foreign assets with SAMA, gold and coins. The second group consists of the negative sources which are government deposits with SAMA, the reserve fund and other liabilities.

In this chapter we derived Saudi money multipliers from alternative money definitions, and we analyzed the effect of the behaviour of the non-bank public, banks and SAMA on the money multipliers in Saudi Arabia. We pointed out that the non-bank public could influence the money multipliers through K (the currency-demand deposits ratio) and t(time deposits-demand deposits ratio). The bank

may influence the money multipliers through the excess reserve ratio (e) and, finally, SAMA has direct influence on multipliers through the total reserve ratio (r) by using the reserve requirement ratio.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

7.1   CONCLUSIONS

The major aims of this study, briefly, are:

(1)   To provide a clear picture of the Saudi money market in terms of its main characteristics, its financial institutions and the obstacles facing the market and its financial institutions.

(2)   To determine appropriate money demand functions for different money definitions in Saudi Arabia and to test the stability and forecasting power of these functions.

(3)   To determine theoretically and empirically the factors affecting the money supply in Saudi Arabia.

(4)   To determine empirically the factors affecting the Riyal market interest rate (domestic interest rate).

The major findings of our empirical work on the demand for real M_0, M_1, M_2 and M_2^a in Saudi Arabia can be summarized as follows:

(1)   We experimented with the real current non-oil GDP and expected income (expected non-oil GDP). The empirical results reveal that the real current non-oil GDP is noticeably superior to the expected real income in explaining the variations of the demand for real M_0, M_1, M_2 and M_2^a (see Tables 5.3 amd 5.4).

(2) The coefficients of the lagged dependent variables of the estimated demand equations for real M_0, M_1, M_2 and M_2^a are statistically highly significant (see Tables 5.3 and 5.5). This indicates that the adjustment of the actual demand for real M_0, M_1, M_2 and M_2^a to the desired level (equilibrium level) is not instantaneous in Saudi Arabia. Moreover, these coefficients are relatively low, ranging from 0.166 to 0.339. This means that there is a relatively long period of adjustment between the actual and desired (equilibrium) level of the demand for real M_0, M_1, M_2 and M_2^a.

(3) The expected exchange rate of the Saudi Riyal against the U.S. Dollar is found to be statistically insignificant in almost all the estimated demand equations for real M_0, M_1, M_2 and M_2^a. This may be due to the multicollinearity which may exist between this variable and other explanatory variables of our proposed money demand function and may also be due to the fact that the exchange rate of the Riyal against the U.S. Dollar has experienced few changes during the period of this study. This implies that the data of Riyal exchange variables does not exhibit sufficient variation over time to detect empirically a systematic relationship between the demand for money and the Riyal exchange rate variable (see Table 5.3).

(4) In all the estimated demand equations for real M_0, M_1, M_2 and M_2^a. the real income (non-oil GDP) is found to be statistically significant at the 5 per cent level with long-run elasticities around 0.74, 0.70, 1.05 and 1.13 respectively (see Tables 5.3 and 5.5). This indicates that the transaction motive plays an important role in determining the demand for money in Saudi Arabia.

(5) In all the estimated demand equations for real M_0, M_1 and M_2, the expected inflation is found to be statistically significant at the 5 per cent level with noticeably high long-run elasticities (around -2.87, -2.35 and -1.40 respectively. This finding indicates that the Saudis are very sensitive to inflation and, consequently, they view real physical assets as an attractive alternative to monetary assets.(6)

(6) The Riyal short-term market interest rate (domestic interest rate) is found to be statistically significant at the 5 per cent level in all the estimated demand equations for real M_1, M_2 and M_2^a. Its long-run elasticities with respect to the demand for real M_1, M_2 and M_2^a are significantly lower than unity (see Tables 5.3 and 5.5). However these findings reflect the change in the Saudis' attitude towards acceptance of interest payment and confirms our hypothesis that the Riyal interest rate has a significant and negative influence on the demand for money in Saudi Arabia.

(7) The U.S. Dollar short-term market interest rate is found to be statistically significant at the 5 per cent level in all the estimated demand equations for real M_2 and M_2^a. However, it has a negligible short- and long-run impact on the demand for real M_2 and M_2^a (see Tables 5.3 and 5.5).

(8) According to the statisticaly criteria of the estimated demand equations for real M_0, M_1, M_2 and M_2^a, it seems that equations 1.5, 2.3, 3.2 and 4.2 represent very appropriate estimates of the demand for real M_0, M_1, M_2 and M_2^a respectively (see Tables 5.3). These

equations are consistent with theory and the findings of many empirical studies on the demand for real M_0, M_1 and M_2 in developed and less-developed countries.

(9) The Chow test is used to test the stability of the estimated demand equations for real M_0, M_1, M_2 and M_2^a in Table 5.3. The results of this test revealed that all the estimated equations are stable at the 5 per cent level of significance, except for equations 2.1a, 2.2, and 2.3 which are found to be unstable at the 5 per cent and 10 per cent levels of significance (see Table 5.6).

(10) The performance and forecasting power of the estimated demand equations for real M_0, M_1, M_2 and M_2^a in Table 5.3 are tested by simulating these equations over the period 1976:1-1988:2. The simulated results (see Tables 5.7 and 5.8) indicate that the estimated equations in Table 5.3 are able to track the actual values of these equations' dependent variables fairly closely (i.e. these equations perform very satisfactorily) and they have good forecasting power.

In this study an attempt is made to determine empirically the factors affecting the Riyal market interest rate (domestic interest rate) using long-run equations in a log-linear form and quarterly data that run from 1979:1 to 1988:2. The estimated equation 2 (see Appendix A of Chapter V) revealed that the U.S. Dollar short-term market interest rate, expected exchange rate of Riyal against U.S. Dollar and excess liquidity defined as the current deposits of the commercial banks with SAMA plus other deposits with SAMA (Banking Security Deposits Accounts) are statistically significant (at the 5 per cent level) with right sign.

Moreover, the statistical criteria of this equation, such as the correlation coefficients (R^2), F- test which is used to test the significance of correlation coefficient and the Durbin-W statistic (D-W) which is used to detect first-order autocorrelation among residuals, indicate that the overall fit of equation 2 (see Appendix A of Chapter V) is very satisfactory. Moreover, the empirical results show that the U.S. Dollar market interest rate is highly significant with elasticity around unity and the elasticity of the expected exchange of the Saudi Riyal against the U.S. Dollar is considerably higher (2.20). This confirms our hypothesis that the external factors (the U.S. Dollar market interest rate and the expected exchange of the Riyal against the U.S. Dollar, have a significant and positive impact on the Saudi Riyal market interest.

In this study, the hypothesis, that the domestic government expenditure, commercial banks' claims on the private sector and the net private sector balance of payments deficit have a significant influence on the growth of the money supply in Saudi Arabia, is tested using short-run equation in log-linear form and annual data that run from 1967 to 1987. The empirical results reveal that the commercial banks' claims on the private sector has an insignificant effect on the money supply and the coefficients of the domestic government expenditure and private sector balance of payment deficit are found to be statistically significant (at the 5 per cent level) with considerably high long-run elasticities (4.89 and -3.50 respectively). This implies that the domestic government expenditure and net private sector balance of payments deficit are the main factors affecting the money supply in the long- and short-run. This finding confirms our argument that the fiscal policy (the government revenue comes almost exclusively from abroad rather than from domestic sources such as taxes, i.e. the domestic government expenditure is the only fiscal policy instrument in Saudi

Arabia which plays an important role in determining the growth of money supply in Saudi Arabia.

7.2 RECOMMENDATIONS

Based on the findings of this study, a number of recommendations can be made in the hope they may be useful for policy-makers in Saudi Arabia:

(1) The policy-makers should pay more attention to the effects of external factors such as foreign interest rates, particularly the U.S. market interest rate, exchange rates of the Saudi Riyal especially against the U.S. Dollar and the balance of payments deficit on the demand and supply for money and the Saudi Riyal market interest rate.

(2) SAMA should change some of its regulatory measures which are obstacles to the financial development in Saudi Arabia. For example, the commercial banks should be allowed to adopt more credit creation activities by allowing them to issue bonds in their own name, and allowing them to borrow from SAMA, not only in the case of a liquidity shortage, but also as an inducement for granting long-term credit. Moreover, SAMA should allow the commercial banks to have their own subsidiary companies or to

participate in investment banks, lease finance and the final channelling of most transactions on the capital market. Improving the legal basis for the use of insurance funds, which might become an important source for commercial banks refinancing, could be another step in this direction. It should be mentioned here that the Saudi commercial banks are not always short of liquidity but are short of lending opportunities.

(3)   The Saudi monetary authority should encourage the public to open other financial institutions, such as insurance and financial investment companies and also should encourage financial institutions to issue financial instruments such as commercial banks' certificates of deposits, bonds and government securities.   In 1983, SAMA took the first step towards creating a fixed-interest securities market when it introduced a Riyal market instrument called Bankers' Security Deposit Accounts (BSDA).   More recently the Finance Ministry has introduced Treasury Bonds on behalf of the Saudi government.   The aim of these instruments is to increase SAMA's control over the money supply and Riyal interest rates to provide risk-free domestic assets for the public and to broaden and deepen the financial markets.   Moreover, Saudi Arabia needs a more diversified retail financial market. Hence, the Saudi monetary authority should encourage the financial institutions to issue a wide range of retail financial instruments.   Unit trusts, for example, are only

in their infancy in Saudi Arabia but there should be scope for development in this area with more business financed through equity placements rather than by lending and bank borrowing. All these would increase the domestic financial investment opportunities and reduce the effects of the external factors (e.g. foreign interest rates, exchange rates and the balance of payments deficits) on the demand for and supply of money and the Saudi Riyal market interest rates.

(4)   As our empirical findings revealed that the commercial banks' claims on the private sector has an insignificant impact on the short- and long-run on the money supply in Saudi Arabia, therefore, the Saudi monetary authority should remove some important obstacles which prevent the commercial banks from increasing and diversifying their loans to all sectors of the Saudi economy, such as the absence of a legal code specifically designed to deal with modern contractural business agreements and finance and the dispute concerning interest payment.   This would give the Saudi monetary authority considerably more control over the money supply and the Riyal market interest rate.   There is, however, the problem of questionable lending by some banks.   Saudi commercial banks lend largely on the base of important names and do not carry out any kind of project evaluation.

REFERENCES

Abdeen, Adnan M. and Shook, Dale N., The Saudi Financial System, London: John Wiley & Sons, 1984.

Adekunle, Joseph O.,'The Demand for Money: Evidence from Developed and Less-Developed Economies', IMF Staff Papers, Vol. 15, No.2 (July 1968), pp.220-66.

Aghevli, B. B. and Khan, Mohsin S., 'Inflationary Finance and the Dynamics of Inflation: Indonesia 1954-1972', American Economic Review, Vol. 67, No. 3 (June 1977), pp.390-403.

Aghevli, B. B. and Khan, M. S., 'Government Deficits and the Inflation - ary Process in Developing Countries', IMF Staff Papers, Vol. 25, No. 3 (September 1978), pp.383-416.

Aghevli, B. B., Mohsin S. Khan, Prabhakar R. Naruckar and Brock, K. Short, 'Monetary Policy in Selected Asian Countries', IMF Staff Papers, Vol. 26, No. 4 (December 1979), pp.775-824.

Al-Ali, Jasim M., 'The Financial Aspects of the Government Budget and Its Impact on the Economy of Saudi Arabia', Unpublished Ph.D. Dissertation, University of Leicester, Leicester, April 1988.

Al-Bashir, Faisal S., A Structural Econometric Model of the Saudi Arabian Economy, 1960-1970, London: Croom Helm Ltd., 1977.

Al-Jasser, M. S., 'The Role of Financial Development in Economic Development: The Case of Saudi Arabia', Unpublished Ph.D. Dissertation, University of California, Riverside 1986.

Al-Saati, Abdul-Rahim A., 'The Islamic Reform to the Saudi Arabian Financial System', Unpublished Ph.D. Dissertation, University of Colorado, 1986.

Ahmed, S., 'Demand for Money in Bangladesh: Some Preliminary Evidence', The Bangladesh Development Studies, 5 (2) (1977), pp.227-237.

Anderson, L. G. and Karnosky, D. S. 'Some Considerations in the Use of Monetary Aggregates for Implementation of Monetary Policy', Federal Reserve Bank of St. Louis Review, 59, No. 9 (1977), pp.2-7.

Artis, M. J. and Lewis, M. K., 'The Demand for Money in the United Kingdom', The Manchester School, 44 (2) (1976), pp.147-181.

Barnett, W., 'Economic Monetary Aggregates: An Application of Index Numbers and Aggregation Theory', Journal of Econometrics, 41 (September 1980), pp.11-48.

Barro, Robert J., 'Unanticipated Money Growth and Unemployment in the United States', American Economic Review, Vol. 67, No. 2 (March 1977), pp.101-105.

Barry, Zain Alabdeen Abdullah, 'Inflation in Saudi Arabia: 1964 to 1978', Unpublished Ph.D. Dissertation, University of Colorado at Boulder, U.S.A., 1980.

Barth, James, Arthur Kraft, and John Kraft, 'Estimation of the Liquidity Trap Using Spline Function, Review of Economics and Statistics, Vol. 58, No. 2 (May 1976), pp.218 -222.

Batts, J. and Dowling, J. M., 'The Stability of the Demand for Money Function in U.K 1880-1975', Quarterly Review of Economics and Business, 24 (3) (1984) pp.37-48.

Baumol, William J., 'The Transactions Demand for Cash: An Inventory Theoretic Approach', Quarterly Journal of Economics, Vol. 66, No. 4 (November 1952), pp.545-556.

Bazdarich, Michael J., 'Money, Inflation and Causality in the United States, 1959-79', Federal Reserve Bank of San Francisco Economic Review, (Spring 1980), pp.50-70.

Behrman, Jere R., 'Price Determination in an Inflationary Economy: The Dynamics of Chilean Inflation Revisited', in Analysis of Development Problems: Studies of the Chilean Economy, Amsterdam: North-Holland Publishing Company, 1973.

Blundel-Wignall, A., M. Rodoni and H. Zeigelschmidt, 'The Demand for Money and Velocity in Major OECD Countries', OECD Working Paper, No. 13 (February 1984), pp.1-32.

Bomhoff, E. J., 'Predicting the Money Multiplier: A Case Study of the U.S.A. and Netherlands', Journal of Monetary Economics, 3 (1977), pp.325-345.

Boorman, John T. and Havrilesky, T., Money Supply, Money Demand and Macroeconomic Models, Illinois: AHM Publishing Corporation, 1972.

Bordo, M. and Jonung, L., 'The Long-Run Behaviour of Income Velocity of Money in Five Advanced Countries, 1879-1975. An Institutional Approach', Economic Inquiry, 19 (January 1981), pp.96-116.

Bottomley, A., 'Interest Rate Determination in Under-developed Rural Areas', American Journal of Agricultural Economics, Vol. 57, No. 2 (May 1975), pp.279-291.

Bought, J. M., 'The Demand for Money in Major OECD Countries'. Occasional Studies of the OECD Economic Outlook, No. 24, (January 1979), pp.35-37.

Bronfendrenner, M. and Mayer, T., 'Liquidity Function in the American Economy', Econometrica, 28 (October 1960), pp.810-834.

Brunner, K. and Meltzer, A. H., 'Predicting Velocity: Implications for Theory and Policy', Journal of Finance, 18 (May 1963), pp.319-354.

Brunner, K. and Meltzer, A. H., 'Some Further Evidence on Supply and Demand Function for Money', Journal of Finance, 19 (May 1964), pp.246-283.

Brunner, K. and Meltzer, A. H., 'Economies of Scale in Cash Balances Reconsidered', Quarterly Journal of Economics, 81 (August, 1967), pp.422-436.

Burger, Albert E., The Money Supply Process, Belmont, Calif: Wadsworth Publishing Co. 1971.

Burger, Albert E., Kalish, Lionel, and Babb, Christopher T., 'Money Stock Control and Its Implications for Monetary Policy', Federal Reserve Bank of St. Louis Review, Vol. 53, No. 10 (October 1971), pp.6-22.

Burger, A. E., 'The Relationship Between Monetary Base and Money: How Close?', Federal Reserve Bank of St. Louis Review, 57 (October 1975), pp.3-8.

Cardoso, Eliana A., 'A Money Demand Equation for Brazil', Journal of Development Economics, 12 (1985), pp.183-193.

Carlson, K. and Hein, S. E., 'Monetary Aggregate or Monetary Indicators', Federal Reserve Bank of St. Louis Review, Vol. 62, No. 9 (November 1980), pp.12-21.

Chandavarkar, A. G., 'Some Aspects of Interest Rate Policies in Less Developed Economies: The Experience of Selected Asian Countries', IMF Staff Papers, Vol. 23, No. 1 (March, 1971), pp.48-112.

Chandavarkar, Anand G., 'Monetization of Developing Economies', IMF Staff Papers, Vol.24, No.3 (November 1977), pp.665-721.

Chatah, M. 'A Monetary Framework for Saudi Arabia', Unpublished Ph.D. Dissertation, University of Texas, Austin, 1983.

Chow, Gregory, 'On the Short-Run and Long-Run Demand for Money', Journal of Political Economy, 74 (April 1966), pp.111-131.

Chow, G. C., 'Tests of Equality between Sets of Coefficients in Two Linear Regressions', Econometrica, Vol. 25, No.3 (1960), pp.591-605.

Chowdhury, A. R., Fackler, J. S. and McMillin, W. D., 'Monetary Policy, Fiscal Policy and Investment Spending: An Empirical Analysis', Southern Economic Journal, 52 (3) (January 1986), pp.794-806.

Christ, Carl F., Econometric Models and Methods, New York: John Wiley and Sons, 1966.

Coats, W. L. and Khathata, D. R., Money and Monetary Policy in LDCs, Oxford: Pergamon Press, 1980.

Crockett, Andrew D. and Goldstein, Morris, 'Inflation Under Fixed and Flexible Exchange Rates, IMF Staff Papers, Vol. 23 (November 1976), pp.509-544.

Crockett, Andrew D. and Evans, Owen J., 'The Demand for Money in Middle Eastern Countries', IMF Staff Papers, Vol. 27, No. 3 (September 1980), pp.543-577.

Cryer, Jonathan, D., Time Series Analysis, Boston: Duxbury Press, 1986.

Darrat, Ali F., 'A Monetarist Approach to Inflation for Saudi Arabia', Unpublished Ph.D. Dissertation, Indiana University, June 1981.

Darrat, Ali F., 'The Money Demand Relationship in Saudi Arabia: An Empirical Investigation', Journal of Economic Studies, VII, No. 3 (1984), p.43.

Darrat, Ali F., 'The Demand for Money in a Developing Economy: The Case of Kenya', World Development, Vol. 13, No.10/11 (1985), pp.1163-1170.

Darrat, Ali F., 'The Demand for Money in Some Major OPEC Members: Regression Estimates and Stability Results', Applied Economics, 18 (1986), pp.127-142.

Davidson, L., Money and the Real World, 2nd edn. London: Macmillan, 1978.

Davidson, L.S. and Hafer, R. W., 'Some Evidence on Selecting an Intermediate Target for Monetary Policy', Southern Economic Journal, 50 (1983), pp.406-421.

Davis, R. G., 'The Monetary Base as an Intermediate Target for Monetary Policy', Federal Reserve Bank of New York Quarterly Review, Vol. 4, No. 4 (Winter 1979/80), pp.1-10.

Diz, A. C., 'Money and Prices in Argentina, 1935-62', in D. Meiselman, ed., Varieties of Monetary Experience, Chicago: University of Chicago Press, 1970.

Edwards, Sebastian and Khan, Mohsin S., 'Interest Rate Determination in Developing Countries', IMF Staff Papers, Vol. 32, No. 3 (September 1985), pp. 377-402.

El-Mallakh, Regaei, The Saudi Arabia Rush to Development, London: Croom Helm Ltd., 1982.

El-Mazri, Zienab Ismael, 'The Demand for Money in Developing Economies: The Case of Libya, Saudi Arabia and Iraq', Unpublished Ph.D. Dissertation, University of Missouri, Columbia, 1982.

Entzler, J., L. Johnson and J. Paulus, 'Some Problems of Money Demand', Brookings Papers on Economic Activity, 1 (1976), pp.261-280.

Fan, L. S. and Liu, Z. R., 'The Demand for Money in Asian Countries: Empirical Evidence', Indian Economic Journal, 18 (1971), pp.475-481.

Friedman, Benjamin, M., 'The Determination of Long Term Interest Rates', Federal Reserve Bank of Boston New England Economic Review (May-June, 1975), pp.35-55.

Friedman, M., 'The Quantity Theory of Money: A Restatement', in M. Friedman, ed., Studies in the Quantity Theory of Money, Chicago, University of Chicago Press, 1956.

Friedman, Milton, 'Factors Affecting the Level of Interest Rates', Conference on Saving and Residential Financing, sponsored by the United States Saving and Loan League, Chicago: The League, (1969), pp.11-27.

Friedman, M. and Modigliani, F., 'Empirical Monetary Macroeconomics: What Has Been Learned in the Last 25 Years?' (Discussion), American Economic Review, 65 (May 1975), pp.176-181.

Fry, Maxwell J., Money, Interest, and Banking in Economic Development, The Johns Hopkins University Press, 1988.

Galbis, V., 'Inflation and Interest Rate Policies in Latin America, 1967-1976', IMF Staff Papers, Vol. 26, No. 2 (June 1979), pp.334-366.

Ghatak, Subrata, Monetary Economics in Developing Countries, London: Macmillan Press, 1981.

Ghatak, S., An Introduction to Development Economics, 2nd edn., London: Allen and Unwin, 1986.

Goldfeld, Stephen M., 'The Demand for Money Revisited', Brookings Papers on Economic Activity, 3 (1973), pp.577-648.

Goldfeld, Stephen M., 'The Case of the Missing Money', Brookings Papers on Economic Activity, 3 (1976), pp.683-730.

Goldfeld, Stephen M., 'The Demand for Money Revisited', in Richard Thorn, ed., Monetary Theory and Policy, New York: Praeger Inc. 1976.

Goldsmith, Raymond, Financial Structure and Development, New Haven: Yale University Press, 1969.

Goldstein, Morris and Khan, Mohsin S., 'Large versus Small Price Changes and the Demand for Imports', IMF Staff Papers, Vol. 23 (March 1976), pp.200-225.

Hafer, R. W., 'Selecting a Monetary Indicator: A Test of the New Monetary Aggregate', Federal Reserve Bank of St. Louis Review, Vol. 63, No. 2 (February 1981), pp.12-18.

Hamburger, M. J., 'Indicator of Monetary Policy: The Argument and the Evidence', American Economic Review, 60 (May 1960), pp. 32-39.

Hamburger, Michael J., 'The Demand for Money in an Open Economy: Journal of Monetary Economics,Vol. 3, No. 1 (January 1977), pp.25-40.

Havrilesky, Thomas M. and Boorman, John T., Current Issues in Monetary Theory and Policy, Illinois, AHM Publishing Corporation, 1976.

Heller, H. R., 'The Demand for Money: The Evidence from the Short-Run Data', Quarterly Journal of Economics, LXXIX (May 1965), pp.291-303.

Heller, H. R. and Khan, M., 'The Demand for Money and the Term Structure of Interest Rates', Journal of Political Economy, 87 (February, 1965), pp.109-129.

Johani, Ali D., Michel Berne and Mixon Wilson, The Saudi Arabian Economy, London: Croom Helm Ltd., 1986.

Johannes, J. M. and Rasche, R. H., 'Predicting the Money Multiplier', Journal of Monetary Economics, 5 (1979), pp.301-335.

Johnson, H. G., 'Monetary Theory and Policy', American Economic Review, 52 (June 1962), pp.335-384.

Johnson, H. G., 'Notes on the Theory of Transactions Demand for Cash', Indian Journal of Economics, 44 (174), Part I (July 1963), pp.1-11.

Johnson, H. G., 'Inside Money, Outside Money, Income, Wealth and Welfare in Monetary Theory', Journal of Money, Credit and Banking, 1 (February, 1969), pp.30-45.

Johnson, Harry G., Macroeconomics and Monetary Theory, London: Gray-Mills Publishing Ltd. 1971.

Johnson, O.E.G., 'Credit Controls as Instruments of Development Policy in the Light of Economic Theory', Journal of Money, Credit and Banking, 6 (February 1974), pp.85-99.

Jonson, P. D., 'Money and Economic Activity in the Open Economy: The United Kingdom 1880-1970', Journal of Political Economy, 84 (September 1976), pp.979-1012.

Kelejian, Harry H. and Oates, Wallace E., Introduction to Econometrics, New York: Harper and Rowe Publishers, 1981.

Keran, Michael and Al Malik, Ahmed, 'Monetary Sources of Inflation in Saudi Arabia', The Federal Reserve Bank of San Francisco Economic Review, Supplement (Winter 1970), pp.5-26.

Khalifa, Said A., 'An Economic Analysis of Foreign Assets, Money Supply and Inflation in Saudi Arabia, 1963-83', Unpublished Ph.D. Dissertation, Utah State University, Longan, Utah, 1985.

Khan, M., 'The Stability of the Demand for Money Function in the U.S. 1901-1965', Journal of Political Economy, 82 (November/December 1974), pp.1205-1220.

Khan, A. H., 'The Demand for Money in Pakistan: Some Further Results', The Pakistan Development Review, XIX (Spring 1980), pp.25-50.

Khusro, A. M., 'An Investigation of Liquidity Preference', Yorkshire Bulletin of Economic and Social Research, 4 (January 1952), pp.1-20.

Knauer, Ramon., The Saudi Economy, New York: Praeger Publishers, 1975.

Koutsoyiannis, A. Theory of Econometrics, London: Macmillan Press Ltd.,1977.

Laidler, David E., 'Some Evidence on the Demand for Money', Journal of Political Economy, 74 (February 1966), pp.55-68.

Laidler, David E., 'The Rate of Interest and the Demand for Money: Some Empirical Evidence', Journal of Political Economy, 74 (December 1966), pp.545-555.

Laidler, David E., 'The Definition of Money: Theoretical and Empirical Problems', Journal of Money, Credit and Banking, 1 (August, 1969), pp.508-525.

Laidler, David E.W. and Parkin, J. M., 'The Demand for Money in the United Kingdom, 1956-1967: Preliminary Estimates', The Manchester School, 38 (December 1970), pp.741-809.

Laidler, David E., _A Survey of Some Current problems in Monetary Theory and Monetary Policy in the 1970s_, London: Oxford University Press, 1971.

Laidler, David E., 'Expectation, Adjustment and the Dynamic Responses of Income to Policy Change', _Journal of Money, Credit and Banking_, 4 (February 1973), pp.157-172.

Laidler, David E., _The Demand for Money: Theories and Evidence_, 2nd edn., New York, 1977.

Laidler, D. E., 'The Demand for Money in the United States - Yet Again', in K. Brunner and A. H. Meltzer (eds.), _The State of Macroeconomics: Carnegie-Rochester Conference Series in Public Policy_, Vol. 12 Amsterdam: North Holland Publishing Company, 1980.

Laidler, David E., _Monetarist Perpsectives_, Oxford: Philip Allan Publishers Limited, 1982.

Laidler, David, E., _The Demand for Money: Theory, Evidence and Problems_, 3rd edn., New York: Harper and Rowe Publishers, 1985.

LeRoy, S. F. and Lindsey, D. E., 'Determining the Monetary Instrument: Diagrammatic Exposition', _American Economic Review_, 68 (1978), p.929-934.

Lewis, W. Arthur, _Development Planning: The Essentials of Economic Policy_, 1st edn., New York: Harper & Rowe, 1966.

Lewis, W. Arthur, Some Aspects of Economic Development, Ghana Publishing Corporation, Accra, 1969.

Looney, Robert E., Saudi Arabia's Development Potential, Lexington, Massachusetts: Lexington Books, 1982.

Looney, Robert E., 'Guidelines for Saudi Arabian Monetary Policy', The IBK Papers Series, No. 26 (December 1987), pp.5-43.

McKinnon, Ronald I., Money and Capital in Economic Development, Washington, D.C.: Brookings Institute, 1973.

Maye, David G., Applications of Econometrics, London: Prentice-Hall International, 1981.

Meier, G. M., Leading Issues in Economic Development, Oxford: Oxford University Press, 1976.

Meiselman, David., ed., Varieties of Monetary Experience, Chicago: University of Chicago Press, 1970.

Melitz, J., 'Inflationary Expectations and the French Demand for Money 1959-70', The Manchester School, 44 (March, 1976), pp.17-41.

Meltzer, Allan, H., 'The Demand for Money: The Evidence from the Time Series', Journal of Political Economy, 71 (June 1963), pp.219-246.

Metwally, Mokhtar M. and Abdel Rahman, Abdel Mahmoud M., 'The Demand for Money in the Economy of Saudi Arabia', <u>Journal of Administrative Sciences</u>, Vol. 12 (2), King Saud University, pp.35-102 (1407/1987).

Modigliani, F. and Papademos, L., 'The Structure of Financial Markets and the Monetary Mechanism in Controlling Monetary Aggregates', <u>Federal Reserve Bank of Boston</u>, III (1986), pp.115-55.

Moliver, Donald M. <u>Oil and Money in Saudi Arabia</u>, Unpublished Ph.D. Dissertation, Virginia Polytechnic Institute, 1978.

Morgan, D. R., 'Fiscal Policy in Oil Exporting Countries, 1972-78', <u>IMF Staff Papers</u>, Vol. 26 (1979), pp. 55-87.

Nagadi, Ahmed H., 'Demand for Money in Saudi Arabia', Unpublished Ph.D. Dissertation, Claremont Graduate School, U.S.A., 1985.

Park, Y. C., 'The Role of Money in Stabilization Policy in Developing Countries', <u>IMF Staff Papers</u>, Vol. 20, No. 2 (July, 1973), pp.220--265.

Presley, J. R., <u>A Guide to the Saudi Arabian Economy</u>, London: Macmillan Press, 1984.

Presley, J. R. and Westaway, T., 'The Monetary Sector in a Financial Surplus Islamic, Developing Economy: The Case of Saudi Arabia', <u>Loughborough University Research Paper No. 3</u>, 1985.

Ryan, B. F., Joiner, B. L. and Ryan, T. A., Minitab Handbook, Boston Massachusetts: Duxbury Press, 1985.

Shan, Edward, S., Financial Deepening in Economic Development, Oxford: Oxford University Press, 1973.

Shapiro, A. A., 'Inflation, Lags and the Demand for Money', International Economic Review, 14 (February 1973), pp.81-96.

Silveira, Antonio M., 'The Demand for Money: The Evidence from the Brazilian Economy', Journal of Money, Credit and Banking, 5(February 1973), p.113.

Subrata Ganguly, M. A., A Treatise on Banking and International Monetary Management, Tejendra Nath Moulik Library, 8-D Ramanath Mazumder Street, Calcutta, 1967.

Suraisry, Jobarah, E.,'Development of a Dualistic Economy: A Case Study of Saudi Arabia', Unpublished Ph.D. Dissertation, University of Colorado, 1979.

Teigen, R., 'The Demand for Money in Norway, 1959-1969', Statsakanomisk Tidsskrift, 44, No. 6 (November 1971), pp.65-99.

Teigen, R. and Smith, W. L., Reading in Money, National Income, and Stabilization Policy, Illinois: Richard Dirwin, Inc., 1975.

Thirwall, A. P., Inflation, Saving and Growth in Developing Countries, London: Macmillan Press, 1974.

Thirwall, A. P., Balance of Payments Theory and United Kingdom Experience, 3rd edn., London: Macmillan Press, 1986.

Thomas, R. L., Introductory Econometrics: Theory and Application, London: Longman Group Limited, 1985.

Tobin, James, 'Money and Economic Growth', Econometrica, 33, No. 4 (October 1965), pp. 671-684.

Vogel, Robert C., 'The Dynamics of Inflation in Latin America 1950-1969' American Economic Review, Vol. 64, No. 1 (March 1974), pp.102-114.

Wai, U. Tun. 'Revisit to Interest Rates Outside the Organized Money Markets of Underdeveloped Countries', Banca Nazionale del Lavoro Quarterly Review, Vol. 2, No. 22 (September 1977). pp. 20-31.

Wilson, Rodney, 'Capital Movements and Interest-Rate Structures in the Arab Gulf: The Case of Saudi Arabia and Bahrain', The Arab Gulf Journal, Vol. 2, No. 1 (April, 1982), pp.40-53.

Wong, C. H. 'The Demand for Money in Developing Countries. Some Theoretical and Empirical Results', Journal of Monetary Economics, 3 (1977), pp. 59-86.

Yotopoulos, P. A. and Nugent, J. Economics of Development, London: Harper & Rowe, 1976.

OFFICIAL SOURCES:

1 Kingdom of Saudi Arabia, Ministry of Planning First Development Plan, 1970-1975.

2 Kingdom of Saudi Arabia, Ministry of Planning Second Development Plan, 1975-1980.

3 Kingdom of Saudi Arabia, Ministry of Planning Third Development Plan, 1980-1985.

4 Kingdom of Saudi Arabia, Ministry of Planning Fourth Development Plan, 1985-1990.

5 Saudi Arabian Monetary Agency, Annual Report, different issues, 1972-1986.

6 Saudi Arabia Monetary Agency, Money and Banking Statistics Quarterly Bulletin, from 1985-1987.

7 Bahrain Monetary Agency, Quarterly Statistical Bulletin, Vol. 14, No. 1, March 1988.

8   Bahrain Monetary Agency, 'Bahrain: An International Financial Center', Quarterly Statistical Bulletin 3rd edition, 1987.   A BMA Publication, 1987.

9   The National Bank of Kuwait (SAK), Gulf Cooperation Council in Figures, 1987.

10 Central Statistical Office, U.K. (C.S.O.), different issues

11 International Monetary Fund, International Financial Statistics, different issues.