Chapter II Monetary Policy and Financial Liberalization in Malaysia

This chapter presents the Malaysian experience in financial liberalization particularly in the monetary arena. This reflects the move towards market-based monetary control whereby the monetary framework was reoriented to suit the changing financial environment. The chapter concludes with developments on selected monetary indicators in the country.

Over the past two decades, steady improvement has taken place in the Malaysian financial environment with a view to bringing about conditions in which monetary policy can be carried out through the market mechanism. The improvement includes not only changes in the instruments of policy but also institutional building and development of domestic financial markets in order to enhance the effectiveness of monetary policy. The development of the domestic financial infrastructure is necessary to improve the transmission mechanism of monetary policy to ensure that policies are transmitted to real economic activity more effectively.

Although liberalization in Malaysia began in early 1970s mainly with liberalization of the interest rates, it is viewed that major financial reforms were undertaken only in 1989 [1] during which there was a clear shift in the paradigm in the conduct of monetary policy. While there was a re-regulation on interest rates in 1987, measures implemented during 1989 focus mainly on structural deregulation and prudential re-regulation. Nevertheless, the most significant measure that has affected the transmission mechanism of monetary policy is the deregulation of interest rate

determination. This removed the Central Bank's power to influence directly the interest rates and hence, the Central Bank has to rely on market-based instruments and conduct open market operations to influence the interest rates. However, measures to liberalize interest rates are not sufficient to ensure effective implementation of monetary policy through market mechanism. It has to be supported with the necessary peripherals i.e. it has to be complemented with the necessary institutional infrastructure and market developments. Therefore, the reforms in 1989 which included measures to develop and deepen the money and capital markets are viewed as the major factor that had influenced the shift in the conduct of monetary policy so as to ensure the smooth and effective transmission of monetary and financial policies.

II.2 Monetary Framework in Malaysia

This section discusses the evolution of monetary framework in Malaysia. The shift in the monetary framework with greater reliance on market-based monetary control occurred in 1989 consistent with the implementation of major financial reforms.

Monetary Framework prior to the 1989 Financial Reforms

Prior to the 1990s, the monetary framework accorded monetary aggregates as important monetary policy variables in policy making. For policy purposes in Malaysia, all three monetary aggregates, M1, M2 and M3 [2], were deemed important

[1] For details on the reforms undertaken, please refer to Annual Report 1988-1990.
[2] Detailed definition of the three monetary aggregates is presented in Appendix II.

policy variables. The definition of money actually used can be critical, since the use of different monetary aggregates can sometimes lead to divergent policy options. In the case of Malaysia, empirical studies of the experience of the 1960s and 1970s indicated that narrow definition of money appeared to be the most appropriate measure of money for policy purposes based on three criteria: the strength of the relationship between changes in money (variously defined) and the changes in aggregate output or income (GNP), the stability of this relationship over time, and the predictive power of this relationship. However, in the early 1980s, reflecting significant changes in the liquidity preference by the public in response to movements in interest rates and the modernization of banking, the two other broader monetary aggregates, namely M2 and M3, have assumed increasing importance in their underlying relationship with economic activity. As the behavior of M1 became unstable, the Central Bank has since shifted its focus to M3 as it appeared to reflect the underlying economic conditions and thus became the most appropriate aggregate for the purpose of monetary control and targeting. In practice, however, all the three monetary aggregates were closely monitored and their behavior tracked on a regular basis for policy purposes. The objective was to ensure that the rate of growth of money over the medium and long term was broadly in line with the increase in real economic activity with as low a rate of inflation as possible, as well as sustainable balance of payments.

In Malaysia, the process of policy formulation at the Central Bank was fairly well established. Every half-year, and more often in periods of stress and strains, the Bank reviewed the current economic and monetary situation and the short term outlook to determine whether the economy was proceeding in the right direction and

whether there was a need for policy measures. Although the Central Bank was mainly concerned with developments in the monetary sector, the review of the real economy and the balance of payments was essential because the quantity and flow of money and credit not only affect all aspects of the economy's production and consumption activities but also were affected by them. Based on the forecasts of the performance of the Malaysian economy, covering the gross national product, unemployment, inflation, sectoral performance, exports, imports, the balance of payments and Government fiscal operations, monetary aggregates were then projected. The projections were made in a number of ways, ranging from pure judgmental projections to the use of econometric models. The performance and forecast of the Malaysian economy were evaluated in the light of existing targets. The main objective was to determine the target range of money supply growth that is conducive to the promotion of the projected output growth with price stability. Implied in the target range of money supply growth was the target range for growth in bank credit, given the Government financial position and the balance of payments performance. These monetary targets were reviewed subsequently in the course of the year, in conjunction with the half-yearly economic review, and may be revised if warranted by changing conditions. Current monetary trends and projections based on existing policies were then evaluated against the latest target range of money supply growth. Should there be a significant deviation from the target range, policy proposals were then considered.

However, unlike other countries, these targets were not announced to the public in Malaysia. For all intents and purposes, they remained as internal working targets. The objective was not only to achieve and end-point target, but to move along a reasonably stable path towards the end-point. However, in view of the uncertainties

underlying the assumptions behind the policy and the need to take into account more recent developments, some degree of flexibility was usually given in the implementation of monetary policy. The 'mechanics' of implementation were quite straightforward, involving mainly the injection (or withdrawal) of liquidity as and when required, but one has to be aware at all times about developments in the market. Sometimes, it requires fine judgement to determine whether a change is a random fluctuation or a fundamental change in trend. The availability of sufficient monetary instruments is a pre-requisite for effective implementation of monetary policy. The Bank relied mainly on variations in the statutory reserve and liquidity requirements and periodic changes in interest rates as the main instrument of monetary management. These have been supplemented by discounting arrangements, credit control, selective credit guidelines, the use of moral suasion and in recent years, foreign exchange swap transactions with the commercial banks as well as recycling (or withdrawal) of Government deposits to (from) the banking system. The narrow scope of the domestic money and capital markets has precluded the effective use of other popular instruments, such as variations in the bank rate and open market operations.

Monetary Framework after the 1989 Financial Reforms: Current technique in monetary operations[3]

In early 1989, the Central Bank embarked on a series of financial reforms to improve and modernize the financial system. The Central Bank introduced a package of reforms to broaden and deepen the process of financial intermediation and to

[3] I wish to thank Ms. Norzila Aziz of the Investment and Treasury Dept., Bank Negara Malaysia for her assistance in providing input to this section.

strengthen the efficiency and effectiveness of existing financial instruments. On the monetary side, major reforms included the appointment of principal dealers to promote the secondary market in Government securities and to increase the efficiency of the Central Bank's open market operations. The financial institutions were also given greater flexibility in the management of their funds and allowed to maintain their statutory reserve requirements based on the average holding over the semi-monthly reserve period instead of daily compliance. Measures were also implemented to promote the creation of an active secondary market in corporate bonds and other commercial papers.

The shift in the implementation and tactics of the conduct of monetary policy in the country began in early 1990s with developments to enhance the breadth and depth of the inter-bank market. The institutional arrangements to establish a more develop inter-bank market and modification to the payment systems represents part of efforts to the move towards a more market-based system of monetary control. These developments were timely as the role of monetary aggregates as policy variables began to diminish during the period with indications of unstable relationship between all three monetary aggregates and real economic activity[4]. The emphasis towards liquidity management became apparent and interest rate gained significance and was upgraded as policy variable. Given that the level of interest rate will influence the availability and cost of money and credit, the objective of the Bank is to maintain the level of domestic interest rates in line with the Bank's policy.

[4] Based on the result of Chow Stability test, the breakpoint period for the monetary aggregate is during the third quarter of 1989.

In the inter-bank market, the Central Bank actively deals only with Principal Dealers in its market operations[5] as the choice of counter parties in inter-bank dealings. That is, for money market tenders, the Central Bank borrows/lends with inter-bank participants via Principal Dealers (PDs). The PDs assist in the collection of bids/offers for submission to the Central Bank and in the confirmation of successful bids/offers. As the lender of last resort or for final liquidity support, the Central Bank may deal directly with any financial institution. The role of the PDs in the Central Bank operations is two fold: to ensure operational efficiency and as part of obligation to participate in the primary market. It is crucial that dealings are undertaken efficiently and with that the Central Bank deals with 16 financial institutions which will then deal with the rest of the financial system. For securities and money market tenders, non-PDs must submit through PDs. The PDs are also obligated to bid a minimum 10% of all government and Central Bank securities offered through tender and all money market tenders conducted by the Central Bank.

The main instruments of monetary policy currently used are direct lending and borrowing and through the conduct of open market operations, which are normally transacted via money market tenders as well as through agent banks (any of PDs). The open market operations are done in terms of Repurchase agreements (Repo) and Reverse repo against acceptable collateral (such as Malaysian Government Securities and Treasury bills, Government Investment Certificates (Islamic papers), Cagamas bonds and notes and other private debt securities); and through the issuance of Bank Negara bills. In addition, other instruments include the centralization of government

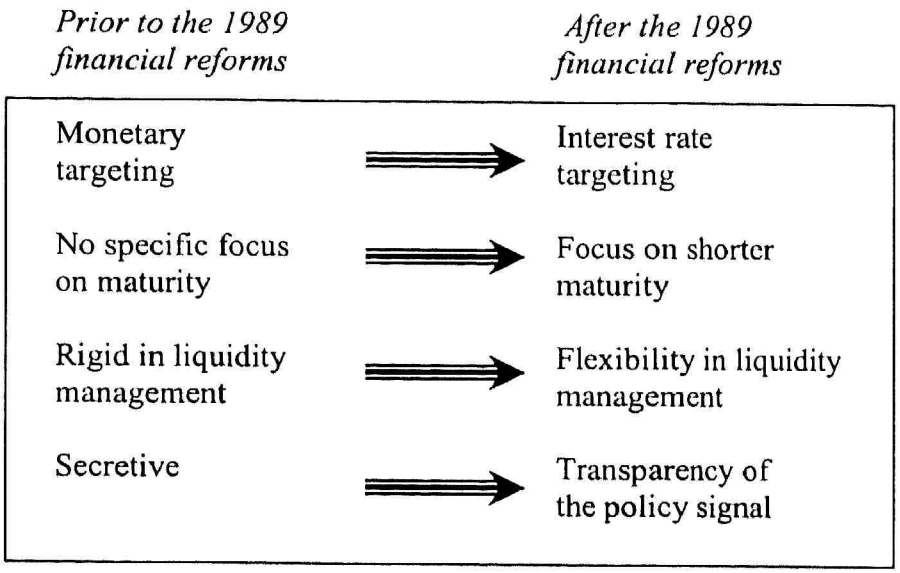
[5] Please refer to Money and Banking in Malaysia, fourth edition 1959-1994 for developments on Principal Dealership.

deposits with the Central Bank and discount window facility[6]. The discount window facility is an outright operations of acceptable securities which involves the buying (injects liquidity) and selling (absorbs liquidity) of securities. This can either be done direct through agent banks or through tender process.

In the process of liquidity operations and management, the fundamental concept is that only central bank can affect the liquidity of the banking system. The daily liquidity operations influence the banks' reserves which then affects the interest rate levels. In addition to the daily forecast of aggregate liquidity, forecast for the week and for the month are also done to gage the liquidity flows and requirements. Assessment of the banks' behavior is also taken into account in determining the liquidity needs and movement of interest rates. Accordingly, to influence the direction of the interest rates, based on the liquidity assessment and the intention either to support, to contract or to expand liquidity into the system, the appropriate monetary tools to be used will be determined to reflect the actions to influence liquidity. As part of effort to increase transparency in the conduct of monetary policy, information on the liquidity position will be disseminated so as to make information available to the players in the market. The evolution of the conduct of monetary policy is summarized in Chart II.1.

[6] For further information on monetary instruments in Malaysia, please refer to Money and Banking in Malaysia, fourth edition 1959-1994 and The Central Bank and the Financial System in Malaysia- A Decade of Change, 1999 (forthcoming).

CHART II.1 : Summary of the evolution of the conduct of monetary policy



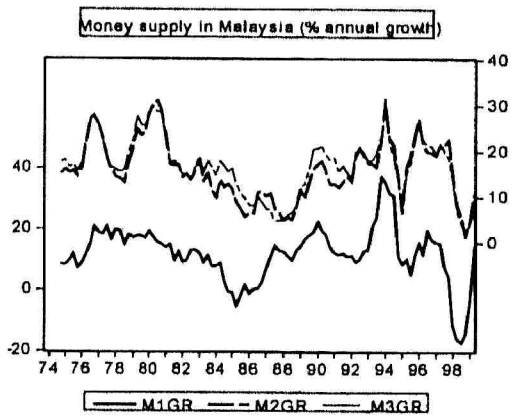
The market-based monetary control system employed by the Central bank puts the emphasis on liquidity operations and management. The change in the technique of monetary control puts demand on the Central Bank and creates awareness of the increased importance of information, of better understanding market psychology, of the tactics and tools and of the signaling impact of the Central Bank's actions in liquidity operations. Hence, the current operating framework of monetary policy focuses on liquidity management, which give importance to the signaling impact of the direction of policy.

Although interest rate is used as the operating target and as policy variable to reflect the stance of monetary policy, the Central Bank also examines other broad range of indicators in its policy formulation. However, among the monetary variables, M3 remains as the medium term indicator of monetary conditions and hence, continued to be used as internal working target.

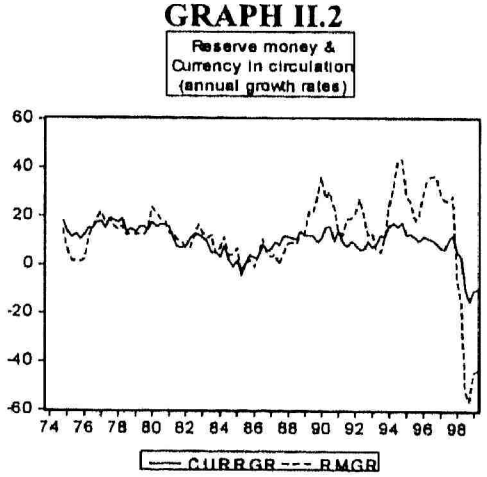
II.3 Developments of selected monetary indicators

Circumstances since 1973[7] necessitated active and deliberate monetary management by the Central Bank, and in the process, exposed the basic strengths and weaknesses of the Bank's ability and effectiveness in managing the ***money supply*** and bank credit to meet national objectives. During the period 1974-80, M1 and M2 expanded rapidly at average annual rates of 14.8% and 20.7% respectively. The acceleration in monetary expansion and sustained at a high level were attributable to buoyant export earnings and expansionary fiscal measures to promote a high and sustained level of economic growth. At the same time, M3 also exhibited a rising trend, with an average annual rate of 18.5% during the period (Graph II.1).

GRAPH II.1



GRAPH II.2



In the 1980s, monetary management was confronted with multiple challenges posed by the prolonged recession in the international economy, the consequent slow down in domestic economic activity, a sharp deterioration in the Government's finances and ballooning balance of payments deficits. Under these circumstances,

monetary policy was formulated to ensure that money would not be the source of financial stability but would instead promote orderly growth of the economy. During the period 1981-1988, M1 and M2 moderated to register average annual rates of 8% and 11% respectively while M3 registered 12.1%. However, the next eight years reflected prolonged and rapid growth, before the episode of the Asian crisis happened. This period reflected mainly excess demand amidst higher income in a near full employment economy. The excess demand was made worse by emerging supply bottlenecks. During the period 1990-93, an added factor to the rapid monetary expansion was the large capital inflows due to favorable interest rates for ringgit-denominated assets as rates of interest in Malaysia rose amidst declining interest rates abroad. In addition to the large interest differentials, capital inflows were encouraged by the appreciation of the ringgit, made more attractive by substantial price increases in the Kuala Lumpur Stock Exchange. The increase in the private sector liquidity, due to stock market, was also reflected in the rise in loan demand by the public. These lending activities connected with the stock market had an impact on money creation through the multiplier process and hence, increased private sector liquidity in the economy. As a result, during the period 1989-1996, M1 and M2 increased at average rates of 16.8% and 17.9% while M3 increased at a higher rate of 19.2%.

Similar to the developments in all the three monetary aggregates, reserve money also exhibited a V-shape trend in its growth during the three sub-periods (Graph II.2). During the period 1974-1980, reserve money increased at average rate of 13.7%. At the same time, currency in circulation also registered high growth at 15.7%. But during the period 1981-88, average growth for both reserve money and

[7] Period of high price increase

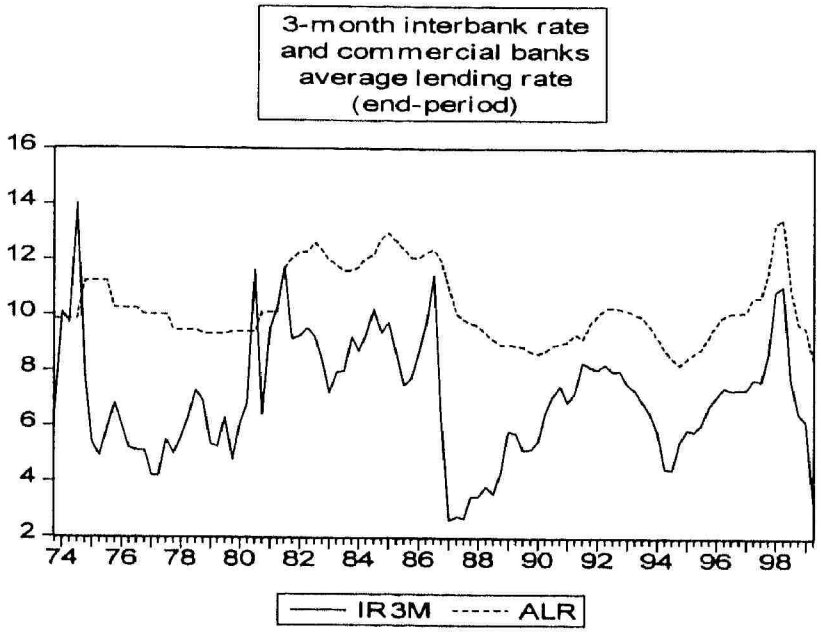
currency moderated to 7.4%. The period of high growth (1989-1996) which coincided with the change in the monetary framework resulted in reserve money to increase significantly at average annual rate of 21.4%. However, currency in circulation grew moderately by 10.7%.

On the ***interest rate*** front, the interest rate liberalization, which began in 1978, did not lead to wide fluctuations in the overall interest rate levels[8]. Deregulation of interest rates was supposed to increase the responsiveness of lending and deposit rates to market forces. However, the experience after 1978 suggested that lending rates behaved in an asymmetrical manner. As a result, Malaysia re-regulated the interest rates in 1983 through the implementation of the base lending rate of the lead banks before finally fully liberalizing it in 1991 when the base lending rate was freed from the administrative control of the Central Bank and a market-oriented interest rate regime was re-introduced. The new base lending rate was computed based on its own cost of funds, including the cost of holding statutory reserves and meeting the liquid assets requirements, as well as administrative and overhead costs but excludes the cost of provision for bad and doubtful debts (Graph II.3). However, in November 1995, as part of further liberalization process, the framework of the base lending rate was revised. Under the new framework, the computation for the base lending rate was linked to the 3-month inter-bank interest rate so that the base lending rate was more responsive to changes in liquidity conditions which would enhance the transmission of monetary policy. However, in the light of the Asian crisis, the computation for the base lending rate was again revised to allow for faster transmission of changes in monetary policy on interest rate levels. The calculation of the base lending rate was

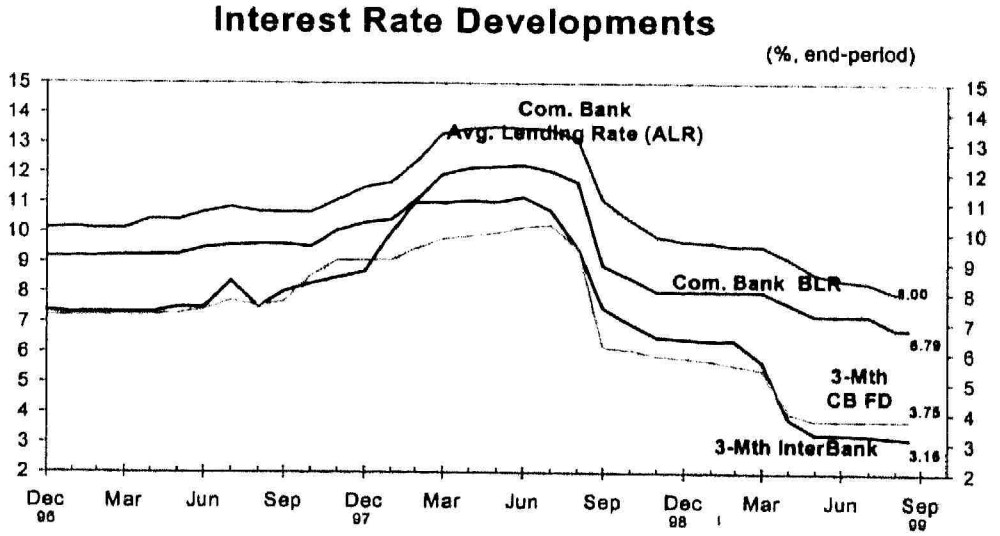
[8] For further analysis , please refer to 'Financial Liberalization and Interest rates Determination in Malaysia, by Dr. Awang Adek Hussin et.al., Bank Negara Malaysia Discussion paper No. 12, 1992.

based on the BNM 3-month intervention rate (which was introduced in December 1997) instead of the 3-month inter-bank interest rate.

GRAPH II.3



GRAPH II.4



In Malaysia, ***velocities of all three monetary aggregates***, M1, M2 and M3 showed declining trends while the degree of fluctuations have increased from the 1980s to the1990s (Graph II.5). Although the standard deviation of the velocity of M1 seemed rather stable up to the period in 1990, the period of the 1990s saw an increase in the fluctuations of the M1 velocity compared to the velocities of the other two aggregates (Chart II.2).

GRAPH II.5

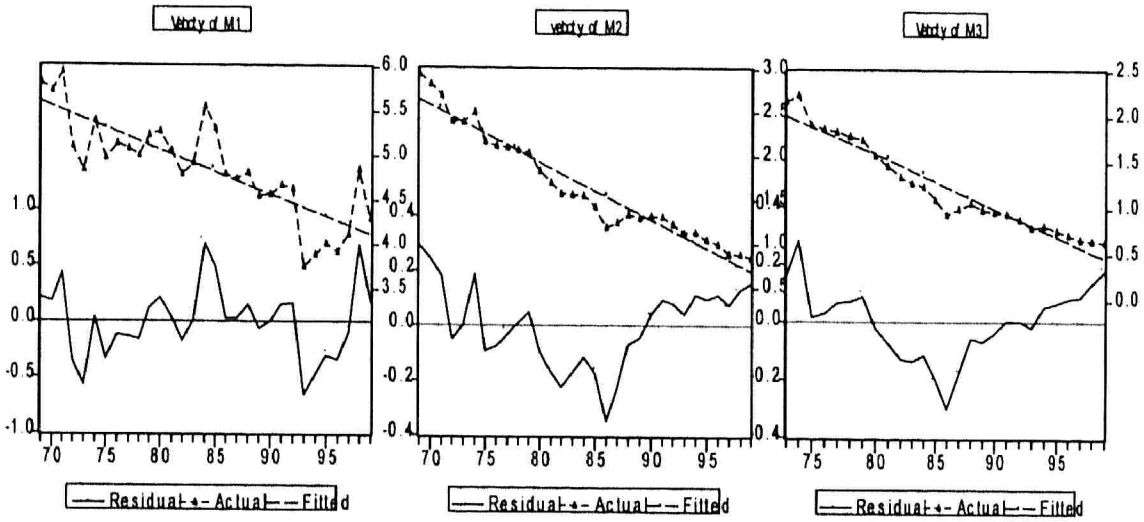
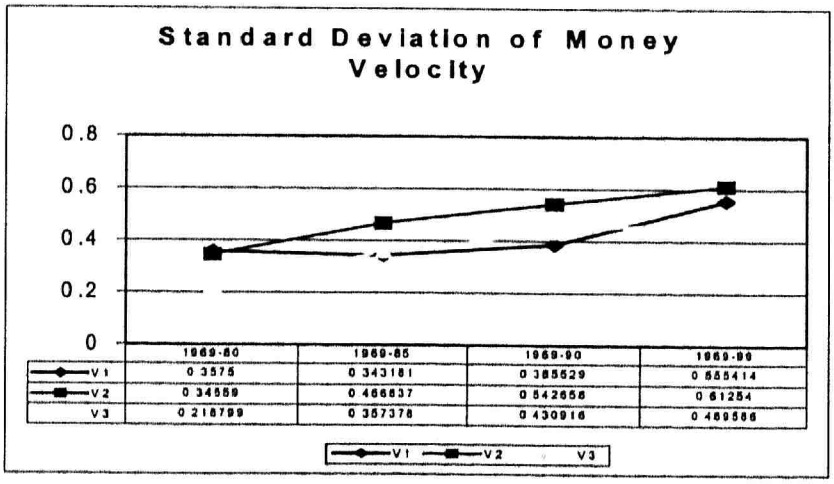


CHART II.2



The increased volatility of M1 velocity in the country as a result of the significant rise in the demand for transaction balances compared to the increase in nominal income was to a large extent attributable to the development in the stock market as well as due to the demand for ringgit in offshore markets. However, development in the bond and equity market is also considered factors contributing to the change in the velocity of broad money. Reforms that increase the number of banks, and spur institutional and technological advances such as credit cards, and electronic transfers of deposits or cash machines, can raise the velocity of broad money and narrow money, as these developments make it easier to convert money into money substitutes. However, as noted by Bordo and Jonung (1990)[9], in many developing countries, the velocity of broad money may decline over time because of the increasing monetization of the economy or financial deepening. As interest rates are liberalized on time deposits, private agents may shift their assets from currency and demand deposits to time deposits, raising the velocity of narrow money, but lowering the velocity of broad money. However, as can be seen from the Graph II.5, the velocity in Malaysia showed a secular declining trend during the period under review[10].

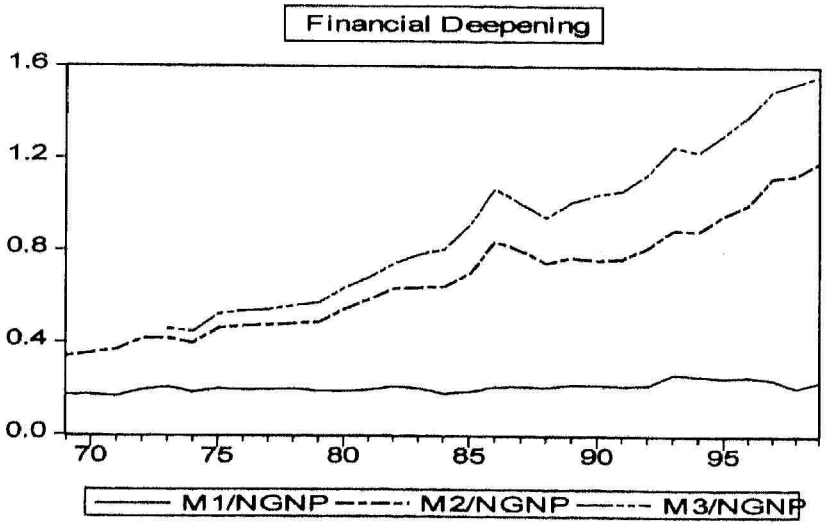
Various studies[11] have confirmed that ***the demand for money*** in Malaysia was unstable as a result of financial liberalization. However, there were differences in the work and results reported in their studies and can be attributed partly to different sample periods and to differences in specification and estimation techniques, and there is also the possibility that some studies have not corrected the test statistics for

[9] In Dekle, Robert and Pradhan, Mahmood. 'Financial Liberalization and Demand for Money in ASEAN countries:Implications for monetary policy', IMF Working Paper, March 1997.
[10] For analysis on recent velocity of other ASEAN countries, refer to Dekle and Pradhan, 1997.
[11] Tseng and Corker (1991), Dr. Razi (1997), Mulyana Soekarni (1997), Dekle and Pradhan (1997).

the small sample size, and may therefore have erroneously rejected the null hypothesis of no cointegration. Using data only up to 1989, Tseng and Corker found that real narrow money demands was stable in Malaysia but found that the broad money was unstable. Dekle and Pradhan, on the other hand, found a stable narrow money demand function although reforms are considered less extensive than in Indonesia and Thailand and financial markets are less developed than Singapore. The estimated real broad money equations were also found to be stable in Malaysia. In other words, based on their study of four ASEAN countries, they found that for Malaysia, they can reject the null hypothesis of no cointegration for real narrow money, nominal broad money and real broad money.

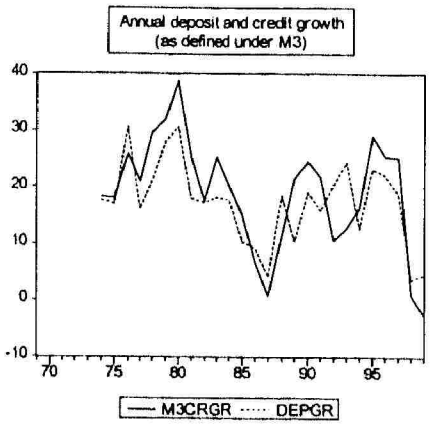
As mentioned above, the decline of the velocity may also be attributable to increased monetization and ***financial deepening***. Financial deepening (increased financial intermediation) has indeed occurred in Malaysia as a result of liberalization as reflected by the upward movement of the ratios M2/NGNP and M3/NGNP (Graph II.6).

GRAPH II.6

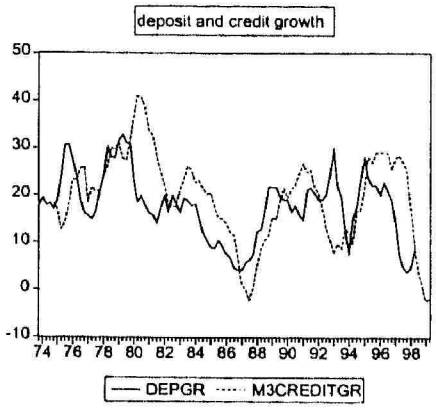


Another significant observation of the impact of financial liberalization was the ***higher credit growth relative to deposit growth***. This phenomenon seemed to apply to Malaysia. Beginning from the early interest rate liberalization in late 1970s, credit growth (M3 private sector credit) had exceeded deposit growth (M3 private sector deposit) except during three occasions. The first was the first recesssion in 1985, the second during the imposition of major contractionary monetary measures to curb credit growth, and the third during the Asian crisis. What is apparent is that following the economic cycles, credit lags behind deposits of about six to twelve months i.e. decline in credit will occur only after deposit have declined and the same is true in reverse i.e. when deposits increase, credit will catch up only after 6 months or so. But if decline in credit is due to major monetary measures, the lag of decline in deposits will take about a year but once credit start to pick up again, increase in deposits take much shorter period of less than six months. From the graphs shown below (Graph II.7 - annual series, and Graph II.8 - quarterly series), comparing the two trough periods of recession indicated that the recent recession is much severe than the first. The earlier recession saw credit picking up after six months deposit was at its trough, but in the recent period, credit growth is still sluggish even after one year has lapse. This is not surprising because in the former situation, the banks were experiencing ample liquidity in view of the favorable export performance and pick up in economic activity. In the current situation, the banks are not flush with liquidity and demand for credit remained weak unlike the earlier situation where there was pent-up demand by the non-bank private sector that were able to spur credit growth. Furthermore, in the current period, the banking institutions are also preoccupied with their restructuring process that in one way or another had constrained growth in credit.

GRAPH II.7

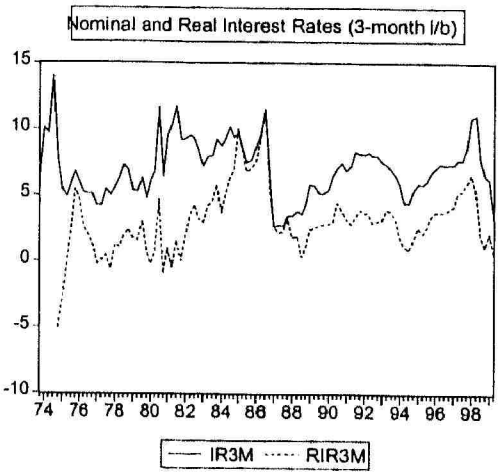


GRAPH II.8

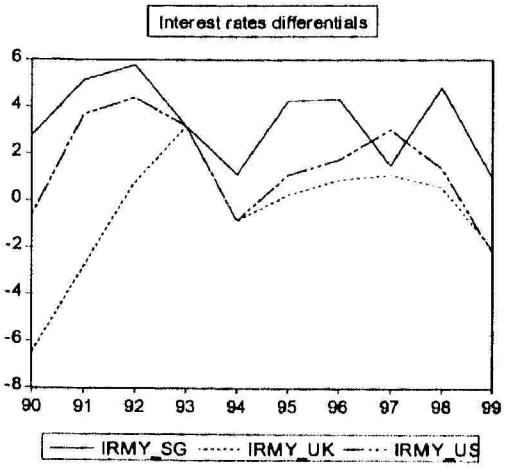


Financial liberalization in Malaysia has included the deregulation of deposit and lending rates, and the introduction or deepening of alternative monetary instruments, bonds and equities. The ***liberalization of interest rates*** has been the most important feature of financial reform in the country. Since the late 1970s, real interest rates remained positive even during periods of high inflation in early 1980s. In Malaysia, deposit rates increased following the 1978 liberalization, ending the era of financial repression. Prior to the crisis, nominal and real interest rates increased markedly between 1988 and 1996 (Graph II.9), raising the money market interest rates differentials especially with the United States, United Kingdom and Singapore (Graph II.10), and inducing the inflows of foreign capital.

GRAPH II.9

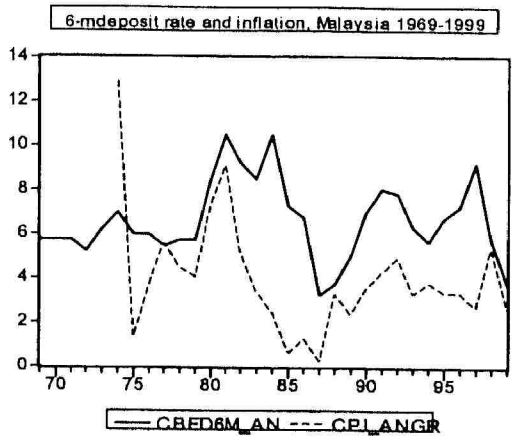


GRAPH II.10

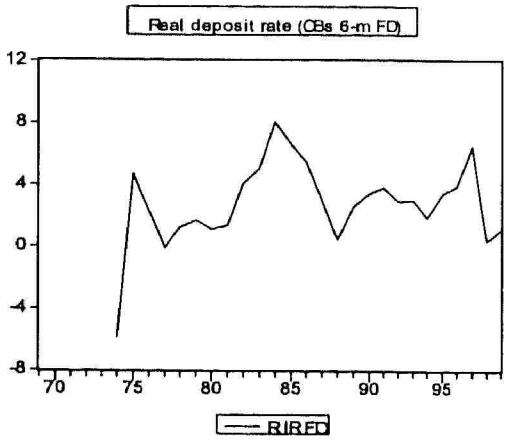


The maintenance of positive real deposit rate of the banking institutions were evident throughout the period under review except during three instances; i.e. during 1977 and during 1988 and 1998 respectively (Graph II.11 and Graph II.12). Nonetheless, the positive real rates were sustained even after the Central Bank relied on the interest rates as the main operating instruments in the conduct of monetary policy since early 1990s. The shift in the technique of the monetary control towards greater emphasis on interest rates was also reflected in the consistent trend between the nominal and real rates, unlike during earlier periods where monetary aggregates became the intermediate target.

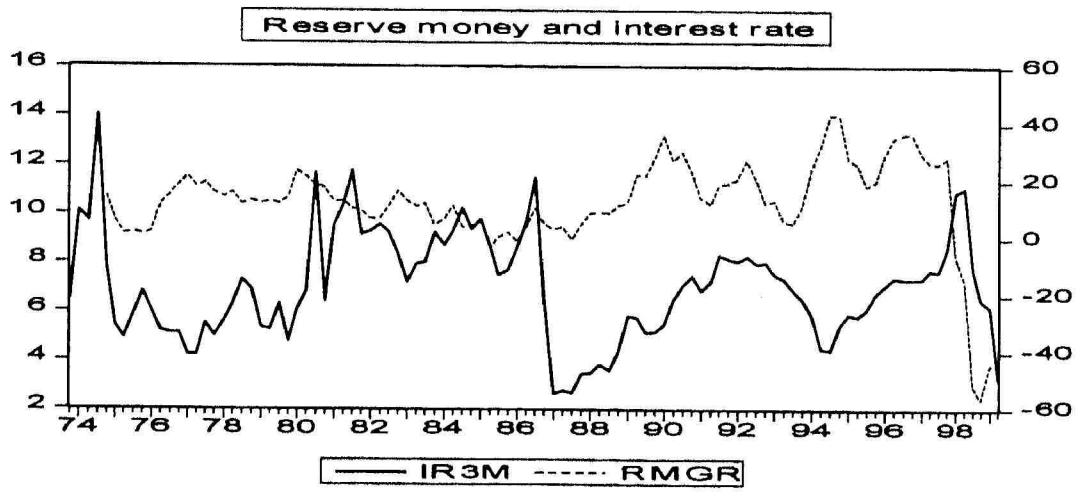
GRAPH II.11



GRAPH II.12



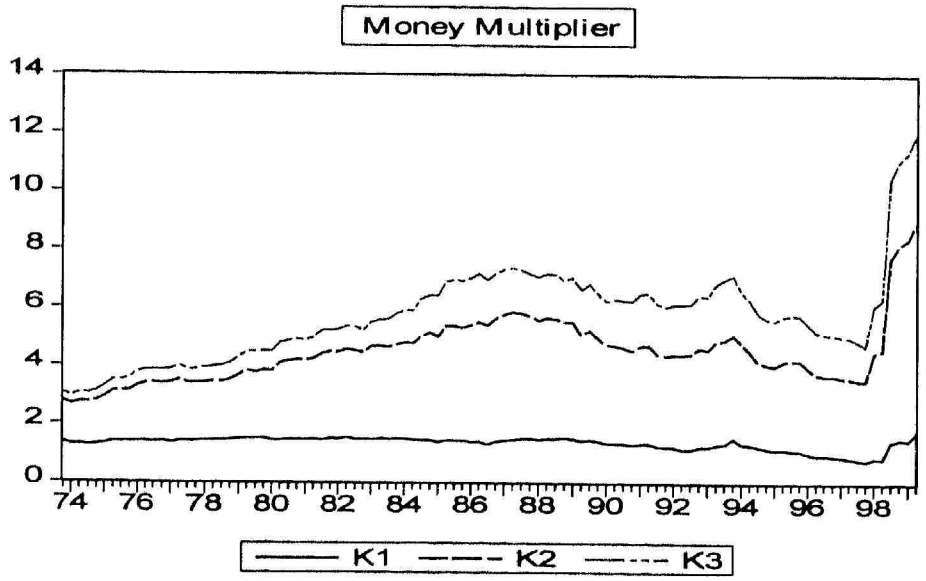
GRAPH II.13



Graph II.13 depicts the impact of monetary policy measures on reserve money and interest rates. Since the first recession, interest rates dipped on three occasions: in 1987, in 1994 and in 1999. The first trough was to stimulate economic recovery, the second was to narrow interest rate differentials to counter the inflows of short term foreign capital and the third was to stimulate economic recovery of the second

recession as a result of the crisis. A significant point to note is the sharp drop in the growth of reserve money due to the recent crisis, which was largely due to the declines in the statutory reserve ratios from 13.5% in early 1998 to 4% currently. At the same time, the impact of slow down in economic activity was reflected in the decline in credit expansion and increase in non-performing loans. This in turn saw a contraction of deposits and with the lower SRR, reserve money growth was very much reduced. Concomitantly, the multiplier rose markedly due to larger contraction in the growth of broad monetary aggregates. However, the money multiplier of narrow money did not exhibit a sharp increase, which indicate its continued stable relationship with reserve money (Graph II.14).

GRAPH II.14



However, comparing the reserve money during the two recessions highlight the significance of the shift in the conduct of monetary policy. During the 1985

recession, although interest rates were reduced to a low level, it had no major impact on the growth of reserve money. In fact, during 1987-1992, interest rates and reserve money seemed to be trending upwards. However, since 1993 or thereabouts, the correlation between the two variables were in reverse, and during the crisis period, reserve money contracted sharply much earlier than the reduction in interest rates. It reached its trough during the third quarter of 1998. This was attributable to the reduction in SRR as mentioned earlier, but the interest rates did not decline correspondingly because the Central Bank absorbed the injected liquidity through its liquidity operations so as to hold the interest rates at the intended level. Only since early 1999 did the Central Bank began to allow the interest rates to decline further.

GRAPH II.15

GRAPH II.16

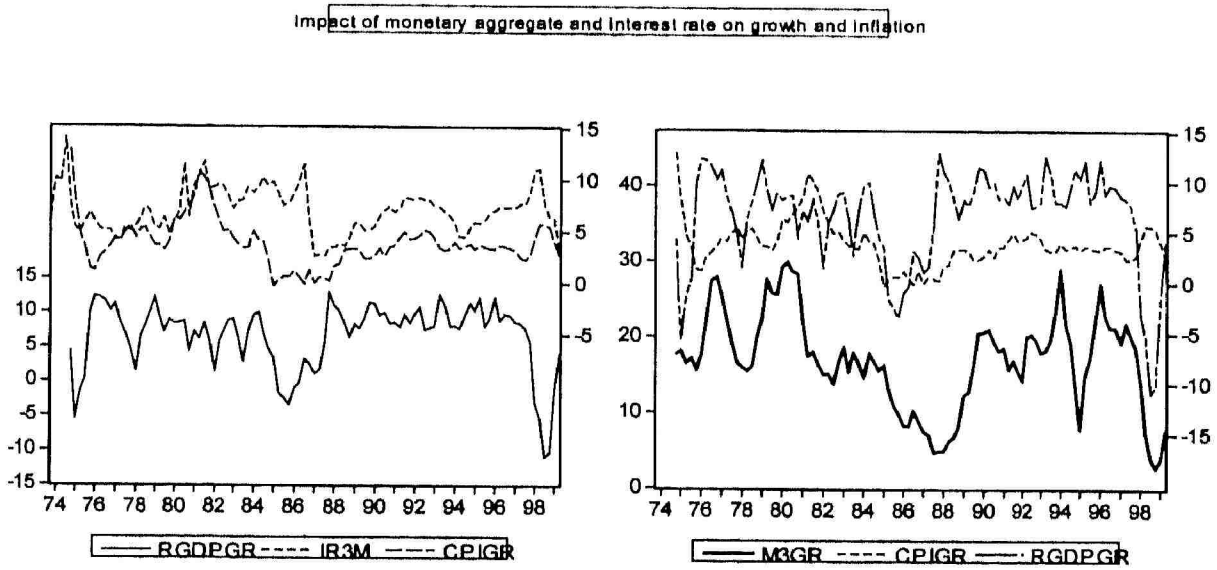


Table II.1: Correlation Matrix

Period 1973:4 - 1999:2

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.409490	0.084272	0.623100	-0.199305	0.332287
M1GR	-0.409490	1.000000	0.593088	-0.595369	0.672569	0.091605
M3GR	0.084272	0.593088	1.000000	-0.214490	0.487813	0.302431
ALR	0.623100	-0.595369	-0.214490	1.000000	-0.502524	0.014129
RGDPGR	**-0.199305**	**0.672569**	**0.487813**	**-0.502524**	1.000000	-0.049958
CPIGR	0.332287	0.091605	0.302431	0.014129	-0.049958	1.000000

Period 1973:4 - 1989:4

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.439952	0.127990	0.630561	-0.178660	0.331735
M1GR	-0.439952	1.000000	0.512249	-0.774432	0.564180	0.373204
M3GR	0.127990	0.512249	1.000000	-0.242858	0.337147	0.461585
ALR	0.630561	-0.774432	-0.242858	1.000000	-0.506039	-0.059040
RGDPGR	**-0.178660**	**0.564180**	**0.337147**	**-0.506039**	1.000000	0.069262
CPIGR	**0.331735**	0.373204	**0.461585**	-0.059040	0.069262	1.000000

Period 1990:1 - 1999:2

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.528021	-0.044003	0.857435	-0.293567	0.443024
M1GR	-0.528021	1.000000	0.746922	-0.559705	0.762209	-0.536250
M3GR	-0.044003	0.746922	1.000000	-0.148119	0.706790	-0.434058
ALR	0.857435	-0.559705	-0.148119	1.000000	-0.523648	0.362112
RGDPGR	**-0.293567**	**0.762209**	**0.706790**	**-0.523648**	1.000000	-0.557105
CPIGR	**0.443024**	-0.536250	**-0.434058**	0.362112	-0.557105	1.000000

Graph II.15 and Graph II.16 show the impact of broad money M3 and interest rates on growth and inflation and the Table II.1 shows the correlation matrix among several selected variables. Although correlation does not imply causation, the correlation coefficients in the above table contain information that reflects the importance of interest rates and monetary aggregates. Breaking up the observations into two sub periods gave additional information on the correlation between money, interest rates, income and prices. Reliance on interest rates since the second sub period is reflected by the higher correlation compared to the first sub period, both for inter-bank interest rates and the average lending rates, which represents the most consistent variable in relation to economic growth throughout the period under review. The correlation also showed the correct signs during the two sub periods denoting the inverse relationship between interest rates and economic growth. However, of significance is the correlation of the monetary aggregates with real GDP as the numbers showed that while M1 continued to be highly correlated with real GDP throughout the period under review, the movement between broad money M3 and real GDP increased during the second sub period implying that money supply in Malaysia has significant impact on real output in the short run. However, in looking at the correlation numbers between money and prices, it is interesting to find that both narrow and broad money recorded negative correlation with inflation during the second sub period although that was the period of high money growth on average. On the other hand, the correlation of inter-bank interest rate with price increased during the second sub period. Hence, is there a possibility to deduce that inflation is not a monetary phenomenon in Malaysia?

Chapter II Monetary Policy and Financial Liberalization in Malaysia

This chapter presents the Malaysian experience in financial liberalization particularly in the monetary arena. This reflects the move towards market-based monetary control whereby the monetary framework was reoriented to suit the changing financial environment. The chapter concludes with developments on selected monetary indicators in the country.

Over the past two decades, steady improvement has taken place in the Malaysian financial environment with a view to bringing about conditions in which monetary policy can be carried out through the market mechanism. The improvement includes not only changes in the instruments of policy but also institutional building and development of domestic financial markets in order to enhance the effectiveness of monetary policy. The development of the domestic financial infrastructure is necessary to improve the transmission mechanism of monetary policy to ensure that policies are transmitted to real economic activity more effectively.

Although liberalization in Malaysia began in early 1970s mainly with liberalization of the interest rates, it is viewed that major financial reforms were undertaken only in 1989 [1] during which there was a clear shift in the paradigm in the conduct of monetary policy. While there was a re-regulation on interest rates in 1987, measures implemented during 1989 focus mainly on structural deregulation and prudential re-regulation. Nevertheless, the most significant measure that has affected the transmission mechanism of monetary policy is the deregulation of interest rate

determination. This removed the Central Bank's power to influence directly the interest rates and hence, the Central Bank has to rely on market-based instruments and conduct open market operations to influence the interest rates. However, measures to liberalize interest rates are not sufficient to ensure effective implementation of monetary policy through market mechanism. It has to be supported with the necessary peripherals i.e. it has to be complemented with the necessary institutional infrastructure and market developments. Therefore, the reforms in 1989 which included measures to develop and deepen the money and capital markets are viewed as the major factor that had influenced the shift in the conduct of monetary policy so as to ensure the smooth and effective transmission of monetary and financial policies.

II.2 Monetary Framework in Malaysia

This section discusses the evolution of monetary framework in Malaysia. The shift in the monetary framework with greater reliance on market-based monetary control occurred in 1989 consistent with the implementation of major financial reforms.

Monetary Framework prior to the 1989 Financial Reforms

Prior to the 1990s, the monetary framework accorded monetary aggregates as important monetary policy variables in policy making. For policy purposes in Malaysia, all three monetary aggregates, M1, M2 and M3 [2], were deemed important

[1] For details on the reforms undertaken, please refer to Annual Report 1988-1990.
[2] Detailed definition of the three monetary aggregates is presented in Appendix II.

policy variables. The definition of money actually used can be critical, since the use of different monetary aggregates can sometimes lead to divergent policy options. In the case of Malaysia, empirical studies of the experience of the 1960s and 1970s indicated that narrow definition of money appeared to be the most appropriate measure of money for policy purposes based on three criteria: the strength of the relationship between changes in money (variously defined) and the changes in aggregate output or income (GNP), the stability of this relationship over time, and the predictive power of this relationship. However, in the early 1980s, reflecting significant changes in the liquidity preference by the public in response to movements in interest rates and the modernization of banking, the two other broader monetary aggregates, namely M2 and M3, have assumed increasing importance in their underlying relationship with economic activity. As the behavior of M1 became unstable, the Central Bank has since shifted its focus to M3 as it appeared to reflect the underlying economic conditions and thus became the most appropriate aggregate for the purpose of monetary control and targeting. In practice, however, all the three monetary aggregates were closely monitored and their behavior tracked on a regular basis for policy purposes. The objective was to ensure that the rate of growth of money over the medium and long term was broadly in line with the increase in real economic activity with as low a rate of inflation as possible, as well as sustainable balance of payments.

In Malaysia, the process of policy formulation at the Central Bank was fairly well established. Every half-year, and more often in periods of stress and strains, the Bank reviewed the current economic and monetary situation and the short term outlook to determine whether the economy was proceeding in the right direction and

whether there was a need for policy measures. Although the Central Bank was mainly concerned with developments in the monetary sector, the review of the real economy and the balance of payments was essential because the quantity and flow of money and credit not only affect all aspects of the economy's production and consumption activities but also were affected by them. Based on the forecasts of the performance of the Malaysian economy, covering the gross national product, unemployment, inflation, sectoral performance, exports, imports, the balance of payments and Government fiscal operations, monetary aggregates were then projected. The projections were made in a number of ways, ranging from pure judgmental projections to the use of econometric models. The performance and forecast of the Malaysian economy were evaluated in the light of existing targets. The main objective was to determine the target range of money supply growth that is conducive to the promotion of the projected output growth with price stability. Implied in the target range of money supply growth was the target range for growth in bank credit, given the Government financial position and the balance of payments performance. These monetary targets were reviewed subsequently in the course of the year, in conjunction with the half-yearly economic review, and may be revised if warranted by changing conditions. Current monetary trends and projections based on existing policies were then evaluated against the latest target range of money supply growth. Should there be a significant deviation from the target range, policy proposals were then considered.

However, unlike other countries, these targets were not announced to the public in Malaysia. For all intents and purposes, they remained as internal working targets. The objective was not only to achieve and end-point target, but to move along a reasonably stable path towards the end-point. However, in view of the uncertainties

underlying the assumptions behind the policy and the need to take into account more recent developments, some degree of flexibility was usually given in the implementation of monetary policy. The 'mechanics' of implementation were quite straightforward, involving mainly the injection (or withdrawal) of liquidity as and when required, but one has to be aware at all times about developments in the market. Sometimes, it requires fine judgement to determine whether a change is a random fluctuation or a fundamental change in trend. The availability of sufficient monetary instruments is a pre-requisite for effective implementation of monetary policy. The Bank relied mainly on variations in the statutory reserve and liquidity requirements and periodic changes in interest rates as the main instrument of monetary management. These have been supplemented by discounting arrangements, credit control, selective credit guidelines, the use of moral suasion and in recent years, foreign exchange swap transactions with the commercial banks as well as recycling (or withdrawal) of Government deposits to (from) the banking system. The narrow scope of the domestic money and capital markets has precluded the effective use of other popular instruments, such as variations in the bank rate and open market operations.

Monetary Framework after the 1989 Financial Reforms: Current technique in monetary operations[3]

In early 1989, the Central Bank embarked on a series of financial reforms to improve and modernize the financial system. The Central Bank introduced a package of reforms to broaden and deepen the process of financial intermediation and to

[3] I wish to thank Ms. Norzila Aziz of the Investment and Treasury Dept., Bank Negara Malaysia for her assistance in providing input to this section.

strengthen the efficiency and effectiveness of existing financial instruments. On the monetary side, major reforms included the appointment of principal dealers to promote the secondary market in Government securities and to increase the efficiency of the Central Bank's open market operations. The financial institutions were also given greater flexibility in the management of their funds and allowed to maintain their statutory reserve requirements based on the average holding over the semi-monthly reserve period instead of daily compliance. Measures were also implemented to promote the creation of an active secondary market in corporate bonds and other commercial papers.

The shift in the implementation and tactics of the conduct of monetary policy in the country began in early 1990s with developments to enhance the breadth and depth of the inter-bank market. The institutional arrangements to establish a more develop inter-bank market and modification to the payment systems represents part of efforts to the move towards a more market-based system of monetary control. These developments were timely as the role of monetary aggregates as policy variables began to diminish during the period with indications of unstable relationship between all three monetary aggregates and real economic activity[4]. The emphasis towards liquidity management became apparent and interest rate gained significance and was upgraded as policy variable. Given that the level of interest rate will influence the availability and cost of money and credit, the objective of the Bank is to maintain the level of domestic interest rates in line with the Bank's policy.

[4] Based on the result of Chow Stability test, the breakpoint period for the monetary aggregate is during the third quarter of 1989.

In the inter-bank market, the Central Bank actively deals only with Principal Dealers in its market operations[5] as the choice of counter parties in inter-bank dealings. That is, for money market tenders, the Central Bank borrows/lends with inter-bank participants via Principal Dealers (PDs). The PDs assist in the collection of bids/offers for submission to the Central Bank and in the confirmation of successful bids/offers. As the lender of last resort or for final liquidity support, the Central Bank may deal directly with any financial institution. The role of the PDs in the Central Bank operations is two fold: to ensure operational efficiency and as part of obligation to participate in the primary market. It is crucial that dealings are undertaken efficiently and with that the Central Bank deals with 16 financial institutions which will then deal with the rest of the financial system. For securities and money market tenders, non-PDs must submit through PDs. The PDs are also obligated to bid a minimum 10% of all government and Central Bank securities offered through tender and all money market tenders conducted by the Central Bank.

The main instruments of monetary policy currently used are direct lending and borrowing and through the conduct of open market operations, which are normally transacted via money market tenders as well as through agent banks (any of PDs). The open market operations are done in terms of Repurchase agreements (Repo) and Reverse repo against acceptable collateral (such as Malaysian Government Securities and Treasury bills, Government Investment Certificates (Islamic papers), Cagamas bonds and notes and other private debt securities); and through the issuance of Bank Negara bills. In addition, other instruments include the centralization of government

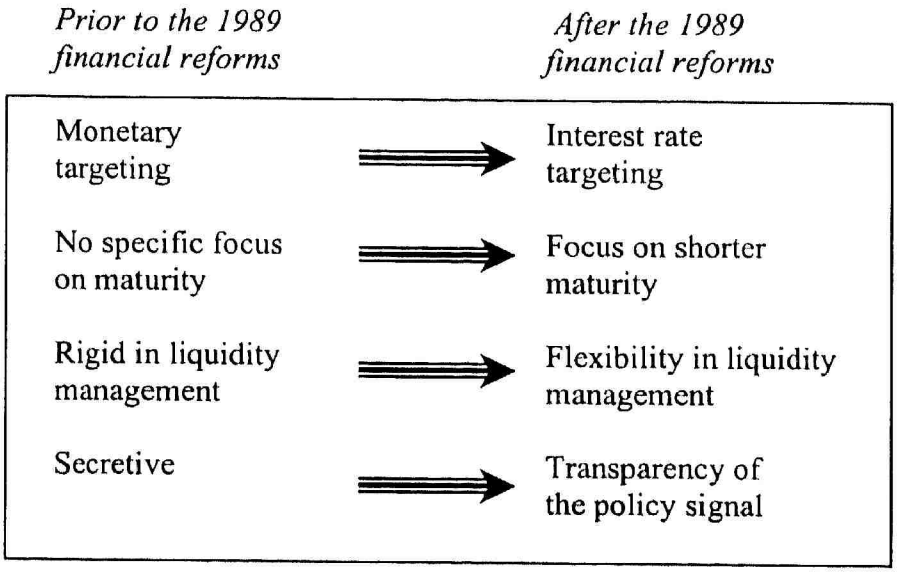
[5] Please refer to Money and Banking in Malaysia, fourth edition 1959-1994 for developments on Principal Dealership.

deposits with the Central Bank and discount window facility[6]. The discount window facility is an outright operations of acceptable securities which involves the buying (injects liquidity) and selling (absorbs liquidity) of securities. This can either be done direct through agent banks or through tender process.

In the process of liquidity operations and management, the fundamental concept is that only central bank can affect the liquidity of the banking system. The daily liquidity operations influence the banks' reserves which then affects the interest rate levels. In addition to the daily forecast of aggregate liquidity, forecast for the week and for the month are also done to gage the liquidity flows and requirements. Assessment of the banks' behavior is also taken into account in determining the liquidity needs and movement of interest rates. Accordingly, to influence the direction of the interest rates, based on the liquidity assessment and the intention either to support, to contract or to expand liquidity into the system, the appropriate monetary tools to be used will be determined to reflect the actions to influence liquidity. As part of effort to increase transparency in the conduct of monetary policy, information on the liquidity position will be disseminated so as to make information available to the players in the market. The evolution of the conduct of monetary policy is summarized in Chart II.1.

[6] For further information on monetary instruments in Malaysia, please refer to Money and Banking in Malaysia, fourth edition 1959-1994 and The Central Bank and the Financial System in Malaysia- A Decade of Change, 1999 (forthcoming).

CHART II.1 : Summary of the evolution of the conduct of monetary policy



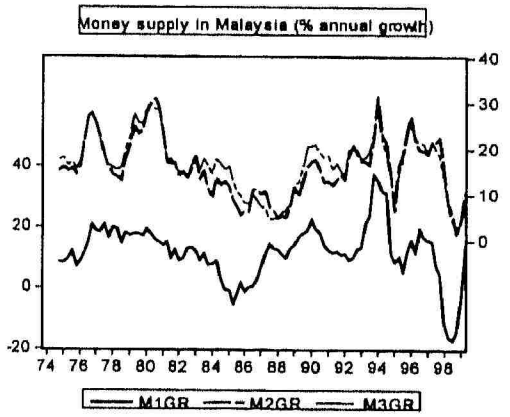
The market-based monetary control system employed by the Central bank puts the emphasis on liquidity operations and management. The change in the technique of monetary control puts demand on the Central Bank and creates awareness of the increased importance of information, of better understanding market psychology, of the tactics and tools and of the signaling impact of the Central Bank's actions in liquidity operations. Hence, the current operating framework of monetary policy focuses on liquidity management, which give importance to the signaling impact of the direction of policy.

Although interest rate is used as the operating target and as policy variable to reflect the stance of monetary policy, the Central Bank also examines other broad range of indicators in its policy formulation. However, among the monetary variables, M3 remains as the medium term indicator of monetary conditions and hence, continued to be used as internal working target.

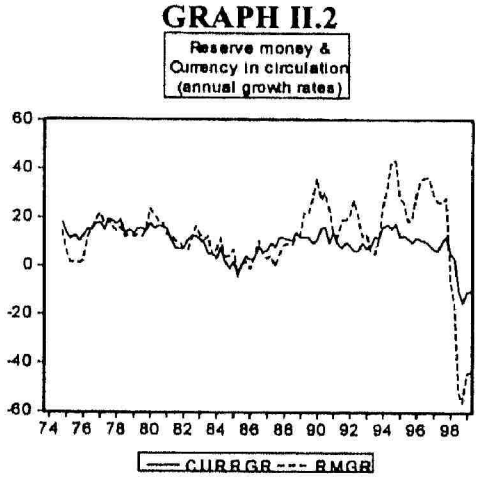
II.3 Developments of selected monetary indicators

Circumstances since 1973[7] necessitated active and deliberate monetary management by the Central Bank, and in the process, exposed the basic strengths and weaknesses of the Bank's ability and effectiveness in managing the ***money supply*** and bank credit to meet national objectives. During the period 1974-80, M1 and M2 expanded rapidly at average annual rates of 14.8% and 20.7% respectively. The acceleration in monetary expansion and sustained at a high level were attributable to buoyant export earnings and expansionary fiscal measures to promote a high and sustained level of economic growth. At the same time, M3 also exhibited a rising trend, with an average annual rate of 18.5% during the period (Graph II.1).

GRAPH II.1



GRAPH II.2



In the 1980s, monetary management was confronted with multiple challenges posed by the prolonged recession in the international economy, the consequent slow down in domestic economic activity, a sharp deterioration in the Government's finances and ballooning balance of payments deficits. Under these circumstances,

monetary policy was formulated to ensure that money would not be the source of financial stability but would instead promote orderly growth of the economy. During the period 1981-1988, M1 and M2 moderated to register average annual rates of 8% and 11% respectively while M3 registered 12.1%. However, the next eight years reflected prolonged and rapid growth, before the episode of the Asian crisis happened. This period reflected mainly excess demand amidst higher income in a near full employment economy. The excess demand was made worse by emerging supply bottlenecks. During the period 1990-93, an added factor to the rapid monetary expansion was the large capital inflows due to favorable interest rates for ringgit-denominated assets as rates of interest in Malaysia rose amidst declining interest rates abroad. In addition to the large interest differentials, capital inflows were encouraged by the appreciation of the ringgit, made more attractive by substantial price increases in the Kuala Lumpur Stock Exchange. The increase in the private sector liquidity, due to stock market, was also reflected in the rise in loan demand by the public. These lending activities connected with the stock market had an impact on money creation through the multiplier process and hence, increased private sector liquidity in the economy. As a result, during the period 1989-1996, M1 and M2 increased at average rates of 16.8% and 17.9% while M3 increased at a higher rate of 19.2%.

Similar to the developments in all the three monetary aggregates, reserve money also exhibited a V-shape trend in its growth during the three sub-periods (Graph II.2). During the period 1974-1980, reserve money increased at average rate of 13.7%. At the same time, currency in circulation also registered high growth at 15.7%. But during the period 1981-88, average growth for both reserve money and

[7] Period of high price increase

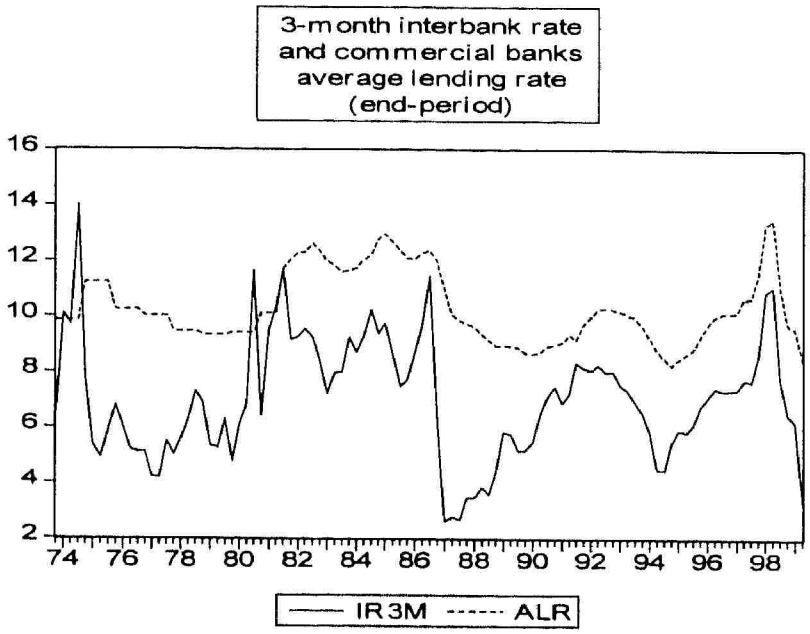
currency moderated to 7.4%. The period of high growth (1989-1996) which coincided with the change in the monetary framework resulted in reserve money to increase significantly at average annual rate of 21.4%. However, currency in circulation grew moderately by 10.7%.

On the ***interest rate*** front, the interest rate liberalization, which began in 1978, did not lead to wide fluctuations in the overall interest rate levels[8]. Deregulation of interest rates was supposed to increase the responsiveness of lending and deposit rates to market forces. However, the experience after 1978 suggested that lending rates behaved in an asymmetrical manner. As a result, Malaysia re-regulated the interest rates in 1983 through the implementation of the base lending rate of the lead banks before finally fully liberalizing it in 1991 when the base lending rate was freed from the administrative control of the Central Bank and a market-oriented interest rate regime was re-introduced. The new base lending rate was computed based on its own cost of funds, including the cost of holding statutory reserves and meeting the liquid assets requirements, as well as administrative and overhead costs but excludes the cost of provision for bad and doubtful debts (Graph II.3). However, in November 1995, as part of further liberalization process, the framework of the base lending rate was revised. Under the new framework, the computation for the base lending rate was linked to the 3-month inter-bank interest rate so that the base lending rate was more responsive to changes in liquidity conditions which would enhance the transmission of monetary policy. However, in the light of the Asian crisis, the computation for the base lending rate was again revised to allow for faster transmission of changes in monetary policy on interest rate levels. The calculation of the base lending rate was

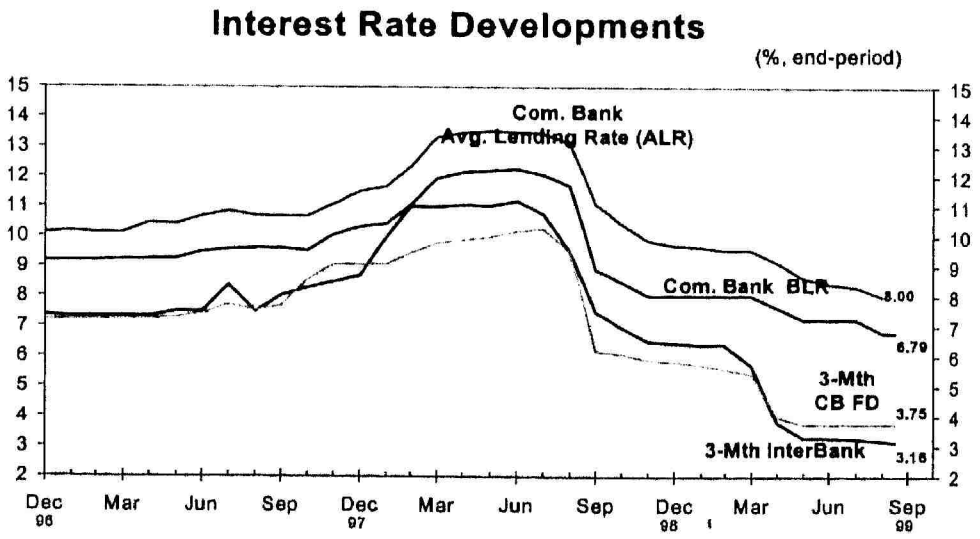
[8] For further analysis , please refer to 'Financial Liberalization and Interest rates Determination in Malaysia, by Dr. Awang Adek Hussin et.al., Bank Negara Malaysia Discussion paper No. 12, 1992.

based on the BNM 3-month intervention rate (which was introduced in December 1997) instead of the 3-month inter-bank interest rate.

GRAPH II.3



GRAPH II.4



In Malaysia, ***velocities of all three monetary aggregates***, M1, M2 and M3 showed declining trends while the degree of fluctuations have increased from the 1980s to the1990s (Graph II.5). Although the standard deviation of the velocity of M1 seemed rather stable up to the period in 1990, the period of the 1990s saw an increase in the fluctuations of the M1 velocity compared to the velocities of the other two aggregates (Chart II.2).

GRAPH II.5

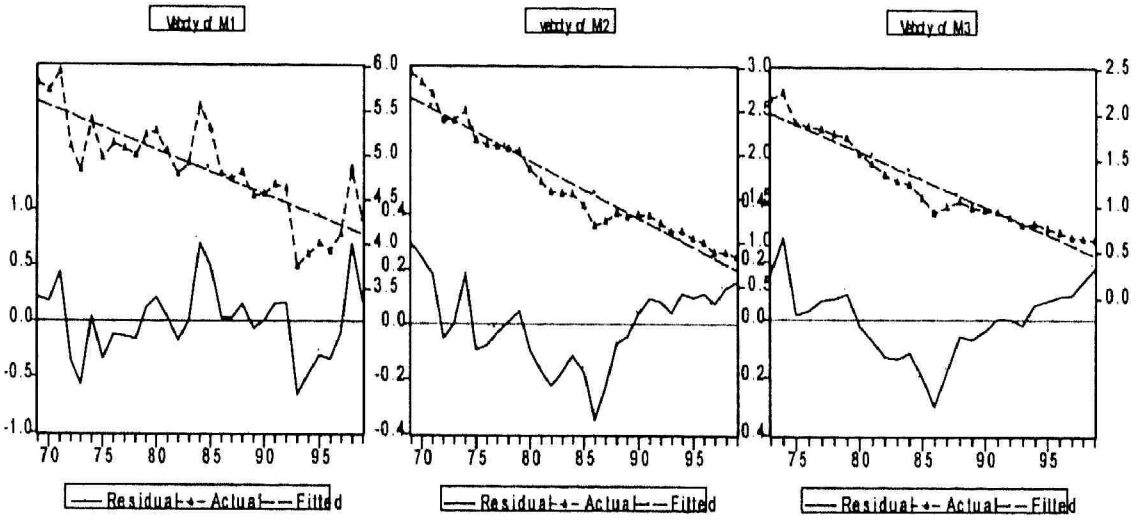
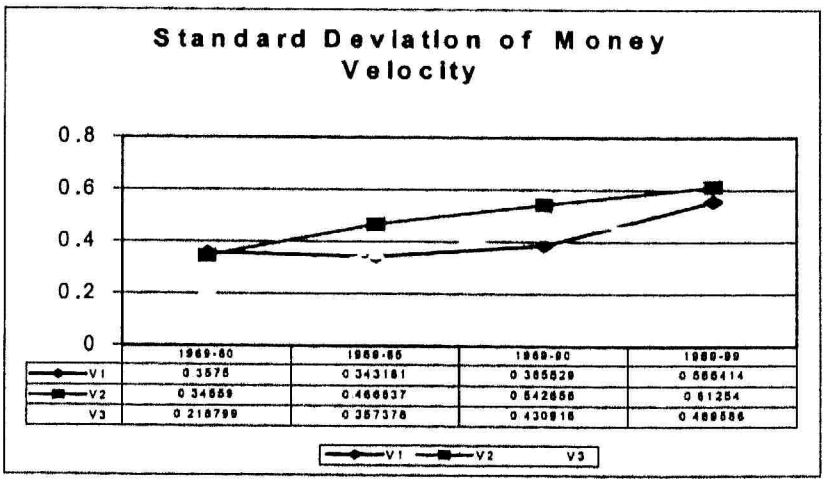


CHART II.2



The increased volatility of M1 velocity in the country as a result of the significant rise in the demand for transaction balances compared to the increase in nominal income was to a large extent attributable to the development in the stock market as well as due to the demand for ringgit in offshore markets. However, development in the bond and equity market is also considered factors contributing to the change in the velocity of broad money. Reforms that increase the number of banks, and spur institutional and technological advances such as credit cards, and electronic transfers of deposits or cash machines, can raise the velocity of broad money and narrow money, as these developments make it easier to convert money into money substitutes. However, as noted by Bordo and Jonung (1990)[9], in many developing countries, the velocity of broad money may decline over time because of the increasing monetization of the economy or financial deepening. As interest rates are liberalized on time deposits, private agents may shift their assets from currency and demand deposits to time deposits, raising the velocity of narrow money, but lowering the velocity of broad money. However, as can be seen from the Graph II.5, the velocity in Malaysia showed a secular declining trend during the period under review[10].

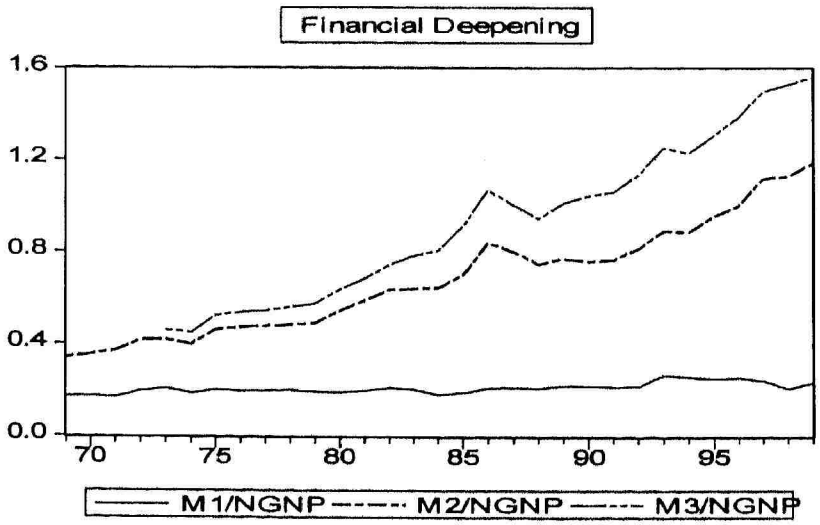
Various studies[11] have confirmed that ***the demand for money*** in Malaysia was unstable as a result of financial liberalization. However, there were differences in the work and results reported in their studies and can be attributed partly to different sample periods and to differences in specification and estimation techniques, and there is also the possibility that some studies have not corrected the test statistics for

[9] In Dekle, Robert and Pradhan, Mahmood. 'Financial Liberalization and Demand for Money in ASEAN countries:Implications for monetary policy', IMF Working Paper, March 1997.
[10] For analysis on recent velocity of other ASEAN countries, refer to Dekle and Pradhan, 1997.
[11] Tseng and Corker (1991), Dr. Razi (1997), Mulyana Soekarni (1997), Dekle and Pradhan (1997).

the small sample size, and may therefore have erroneously rejected the null hypothesis of no cointegration. Using data only up to 1989, Tseng and Corker found that real narrow money demands was stable in Malaysia but found that the broad money was unstable. Dekle and Pradhan, on the other hand, found a stable narrow money demand function although reforms are considered less extensive than in Indonesia and Thailand and financial markets are less developed than Singapore. The estimated real broad money equations were also found to be stable in Malaysia. In other words, based on their study of four ASEAN countries, they found that for Malaysia, they can reject the null hypothesis of no cointegration for real narrow money, nominal broad money and real broad money.

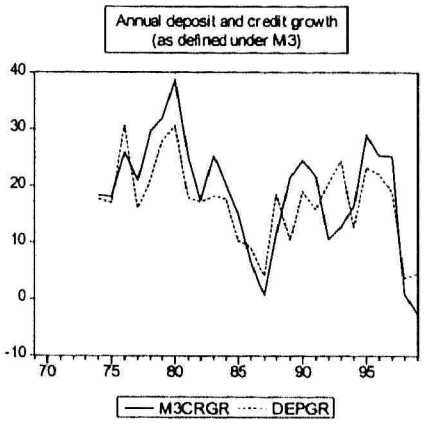
As mentioned above, the decline of the velocity may also be attributable to increased monetization and ***financial deepening***. Financial deepening (increased financial intermediation) has indeed occurred in Malaysia as a result of liberalization as reflected by the upward movement of the ratios M2/NGNP and M3/NGNP (Graph II.6).

GRAPH II.6

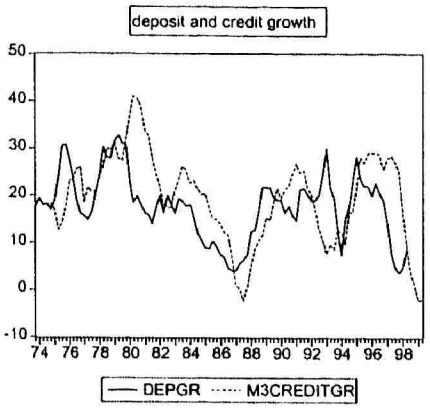


Another significant observation of the impact of financial liberalization was the ***higher credit growth relative to deposit growth***. This phenomenon seemed to apply to Malaysia. Beginning from the early interest rate liberalization in late 1970s, credit growth (M3 private sector credit) had exceeded deposit growth (M3 private sector deposit) except during three occasions. The first was the first recesssion in 1985, the second during the imposition of major contractionary monetary measures to curb credit growth, and the third during the Asian crisis. What is apparent is that following the economic cycles, credit lags behind deposits of about six to twelve months i.e. decline in credit will occur only after deposit have declined and the same is true in reverse i.e. when deposits increase, credit will catch up only after 6 months or so. But if decline in credit is due to major monetary measures, the lag of decline in deposits will take about a year but once credit start to pick up again, increase in deposits take much shorter period of less than six months. From the graphs shown below (Graph II.7 - annual series, and Graph II.8 - quarterly series), comparing the two trough periods of recession indicated that the recent recession is much severe than the first. The earlier recession saw credit picking up after six months deposit was at its trough, but in the recent period, credit growth is still sluggish even after one year has lapse. This is not surprising because in the former situation, the banks were experiencing ample liquidity in view of the favorable export performance and pick up in economic activity. In the current situation, the banks are not flush with liquidity and demand for credit remained weak unlike the earlier situation where there was pent-up demand by the non-bank private sector that were able to spur credit growth. Furthermore, in the current period, the banking institutions are also preoccupied with their restructuring process that in one way or another had constrained growth in credit.

GRAPH II.7

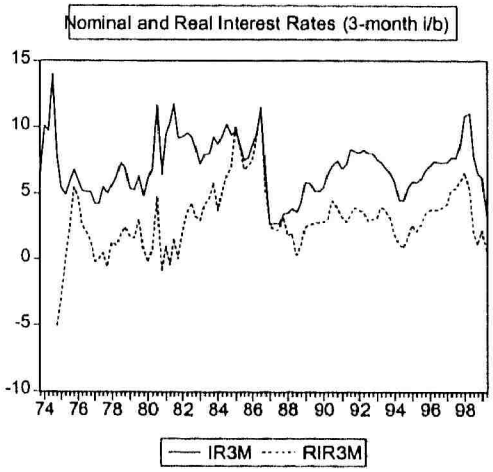


GRAPH II.8

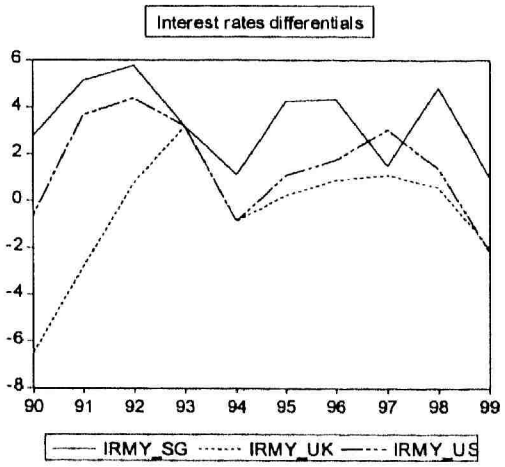


Financial liberalization in Malaysia has included the deregulation of deposit and lending rates, and the introduction or deepening of alternative monetary instruments, bonds and equities. The ***liberalization of interest rates*** has been the most important feature of financial reform in the country. Since the late 1970s, real interest rates remained positive even during periods of high inflation in early 1980s. In Malaysia, deposit rates increased following the 1978 liberalization, ending the era of financial repression. Prior to the crisis, nominal and real interest rates increased markedly between 1988 and 1996 (Graph II.9), raising the money market interest rates differentials especially with the United States, United Kingdom and Singapore (Graph II.10), and inducing the inflows of foreign capital.

GRAPH II.9

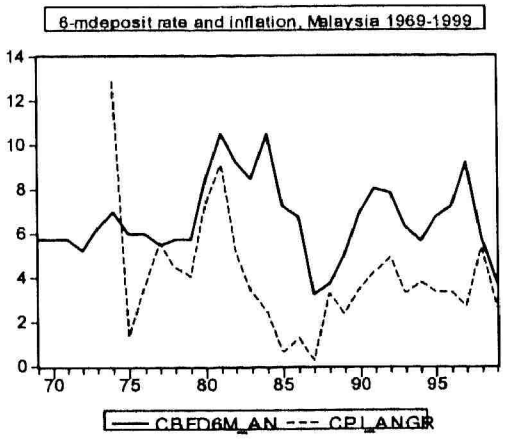


GRAPH II.10

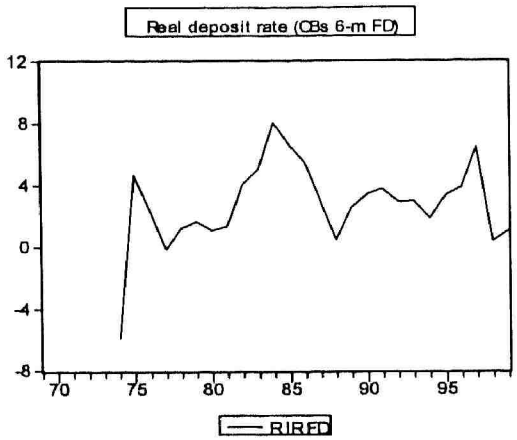


The maintenance of positive real deposit rate of the banking institutions were evident throughout the period under review except during three instances; i.e. during 1977 and during 1988 and 1998 respectively (Graph II.11 and Graph II.12). Nonetheless, the positive real rates were sustained even after the Central Bank relied on the interest rates as the main operating instruments in the conduct of monetary policy since early 1990s. The shift in the technique of the monetary control towards greater emphasis on interest rates was also reflected in the consistent trend between the nominal and real rates, unlike during earlier periods where monetary aggregates became the intermediate target.

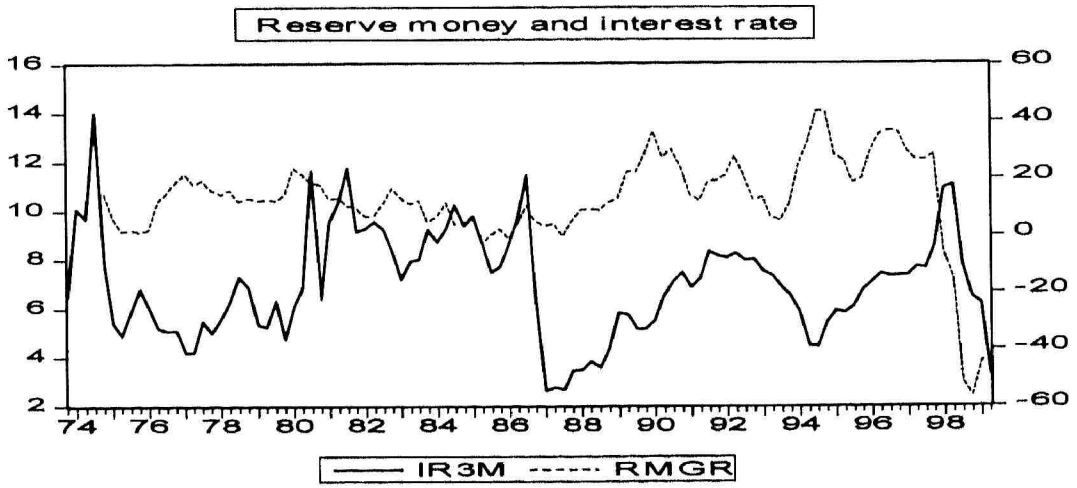
GRAPH II.11



GRAPH II.12



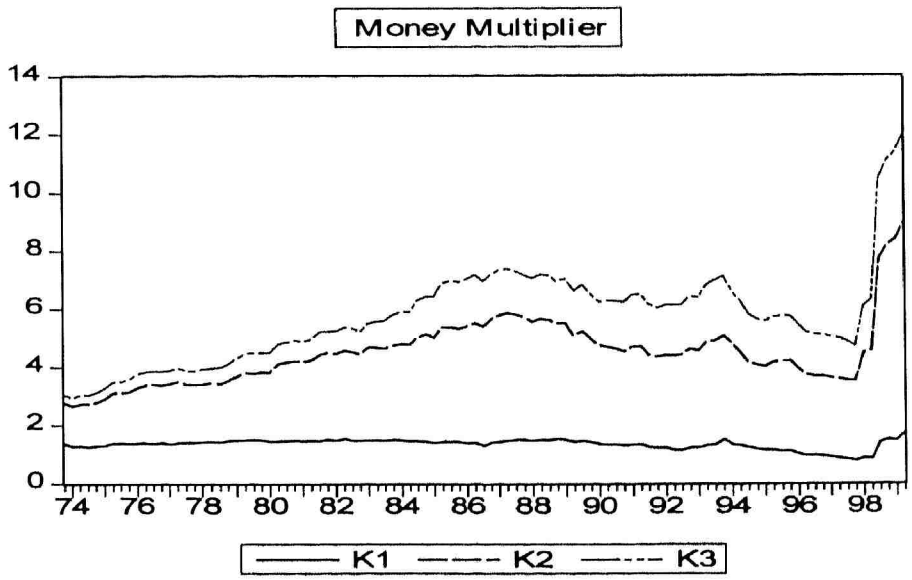
GRAPH II.13



Graph II.13 depicts the impact of monetary policy measures on reserve money and interest rates. Since the first recession, interest rates dipped on three occasions: in 1987, in 1994 and in 1999. The first trough was to stimulate economic recovery, the second was to narrow interest rate differentials to counter the inflows of short term foreign capital and the third was to stimulate economic recovery of the second

ecession as a result of the crisis. A significant point to note is the sharp drop in the growth of reserve money due to the recent crisis, which was largely due to the declines in the statutory reserve ratios from 13.5% in early 1998 to 4% currently. At the same time, the impact of slow down in economic activity was reflected in the decline in credit expansion and increase in non-performing loans. This in turn saw a contraction of deposits and with the lower SRR, reserve money growth was very much reduced. Concomitantly, the multiplier rose markedly due to larger contraction in the growth of broad monetary aggregates. However, the money multiplier of narrow money did not exhibit a sharp increase, which indicate its continued stable relationship with reserve money (Graph II.14).

GRAPH II.14



However, comparing the reserve money during the two recessions highlight the significance of the shift in the conduct of monetary policy. During the 1985

recession, although interest rates were reduced to a low level, it had no major impact on the growth of reserve money. In fact, during 1987-1992, interest rates and reserve money seemed to be trending upwards. However, since 1993 or thereabouts, the correlation between the two variables were in reverse, and during the crisis period, reserve money contracted sharply much earlier than the reduction in interest rates. It reached its trough during the third quarter of 1998. This was attributable to the reduction in SRR as mentioned earlier, but the interest rates did not decline correspondingly because the Central Bank absorbed the injected liquidity through its liquidity operations so as to hold the interest rates at the intended level. Only since early 1999 did the Central Bank began to allow the interest rates to decline further.

GRAPH II.15

GRAPH II.16

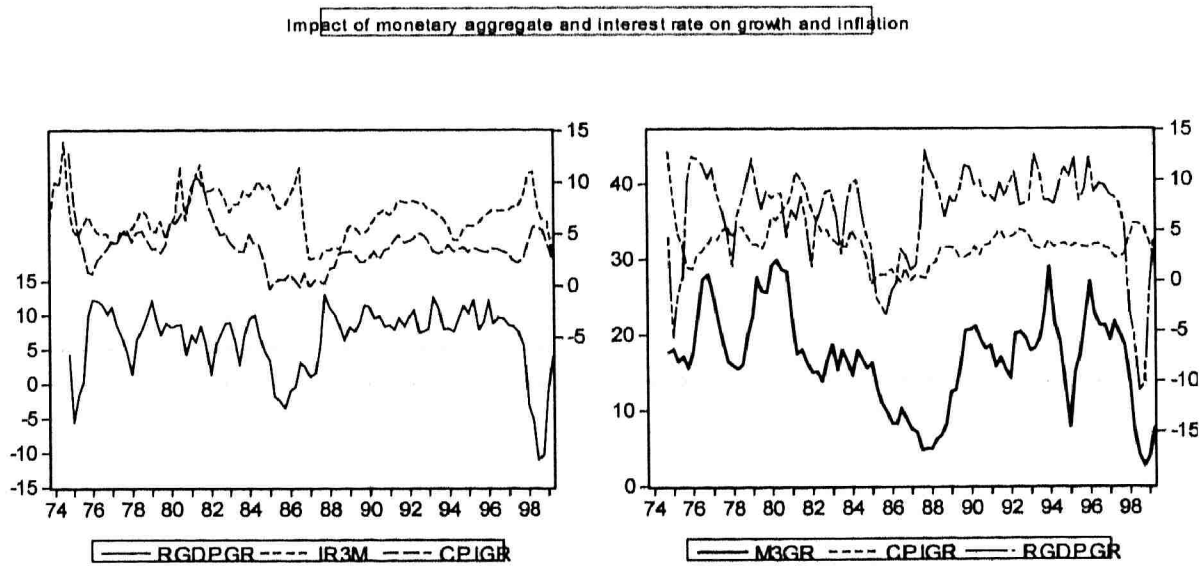


Table II.1: Correlation Matrix

Period 1973:4 - 1999:2

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.409490	0.084272	0.623100	-0.199305	0.332287
M1GR	-0.409490	1.000000	0.593088	-0.595369	0.672569	0.091605
M3GR	0.084272	0.593088	1.000000	-0.214490	0.487813	0.302431
ALR	0.623100	-0.595369	-0.214490	1.000000	-0.502524	0.014129
RGDPGR	**-0.199305**	**0.672569**	**0.487813**	**-0.502524**	1.000000	-0.049958
CPIGR	0.332287	0.091605	0.302431	0.014129	-0.049958	1.000000

Period 1973:4 - 1989:4

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.439952	0.127990	0.630561	-0.178660	0.331735
M1GR	-0.439952	1.000000	0.512249	-0.774432	0.564180	0.373204
M3GR	0.127990	0.512249	1.000000	-0.242858	0.337147	0.461585
ALR	0.630561	-0.774432	-0.242858	1.000000	-0.506039	-0.059040
RGDPGR	**-0.178660**	**0.564180**	**0.337147**	**-0.506039**	1.000000	0.069262
CPIGR	**0.331735**	0.373204	**0.461585**	-0.059040	0.069262	1.000000

Period 1990:1 - 1999:2

	IR3M	M1GR	M3GR	ALR	RGDPGR	CPIGR
IR3M	1.000000	-0.528021	-0.044003	0.857435	-0.293567	0.443024
M1GR	-0.528021	1.000000	0.746922	-0.559705	0.762209	-0.536250
M3GR	-0.044003	0.746922	1.000000	-0.148119	0.706790	-0.434058
ALR	0.857435	-0.559705	-0.148119	1.000000	-0.523648	0.362112
RGDPGR	**-0.293567**	**0.762209**	**0.706790**	**-0.523648**	1.000000	-0.557105
CPIGR	**0.443024**	-0.536250	**-0.434058**	0.362112	-0.557105	1.000000

Graph II.15 and Graph II.16 show the impact of broad money M3 and interest rates on growth and inflation and the Table II.1 shows the correlation matrix among several selected variables. Although correlation does not imply causation, the correlation coefficients in the above table contain information that reflects the importance of interest rates and monetary aggregates. Breaking up the observations into two sub periods gave additional information on the correlation between money, interest rates, income and prices. Reliance on interest rates since the second sub period is reflected by the higher correlation compared to the first sub period, both for inter-bank interest rates and the average lending rates, which represents the most consistent variable in relation to economic growth throughout the period under review. The correlation also showed the correct signs during the two sub periods denoting the inverse relationship between interest rates and economic growth. However, of significance is the correlation of the monetary aggregates with real GDP as the numbers showed that while M1 continued to be highly correlated with real GDP throughout the period under review, the movement between broad money M3 and real GDP increased during the second sub period implying that money supply in Malaysia has significant impact on real output in the short run. However, in looking at the correlation numbers between money and prices, it is interesting to find that both narrow and broad money recorded negative correlation with inflation during the second sub period although that was the period of high money growth on average. On the other hand, the correlation of inter-bank interest rate with price increased during the second sub period. Hence, is there a possibility to deduce that inflation is not a monetary phenomenon in Malaysia?