THE RELATIONSHIP BETWEEN MONETARY GROWTH AND THE MONEY MARKET RATES: THE MALAYSIAN EXPERIENCE

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ABSTRACT

It is widely believed that the market interest rates follow a sequential time path in response to changes in the monetary growth rate. The exact pattern of the response receives greater attention in the monetary field as it reflects the effectiveness of the money supply as conduits of monetary policy. This study examines the issue in the Malaysian financial market. The increase in the growth rate and variability of the money supply are highly associated with the high level and variability of interest rates with certain lags. In the Malaysian financial market, the inverse relationship of monetary growth and interest rates (the liquidity effect) last for about 13 months after the initial changes in the money supply, thereafter, the direction of the interest rate response is positive. However, the positive response (income and price level effects) is not significant in the Malaysian economy. There is a high possibility that the magnitude of these three effects will be affected by the financial market liberalization that is taking place in the Malaysian economy. The results of causality tests conclude with the endogeneity of monetary growth. Causality is unidirectional, running from interbank rates to monetary growth. The findings can be explained by the low inflation economy and possibly the low level of efficiency in the Malaysian financial market. The pattern of causation implies the adoption of interest rate targeting policies by the central bank. In addition, it also supports the use of the KLIBOR (Kuala Lumpur Interbank Offer Rates) as measures of liquidity in the Malaysian economy.

The importance of the supply of money as the determinant of economic variables has been a controversial issue in the monetary debate (see Patinkin (1989), Friedman and Schwartz (1982), and Johnson (1978)). Theoretically, interest rates are believed to follow a sequence of responses

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toward changes in the monetary growth rate. These effects are known as liquidity, income, an price level effects. The debate is centered on the existence and the degree of the impact c each of these effects. This has led to the division of monetary philosophy into two group Keynesians and Monetarists.

This study investigates the relationship between monetary growth and money market rates i the Malaysian economy and is broken up into four sections. Section I reviews the theoretic background and previous studies surrounding the topic. Studies relating to the Malaysian financi market are also discussed in section I. Section II describes the data sources and methodolog employed in this study. The results and discussion of the analyses are presented in Section II The paper ends with a brief summary and conclusion in Section IV.

I. THEORETICAL BACKGROUND AND PREVIOUS STUDIES

In the Keynesian model, money is viewed as a non-neutral force which produces permane changes in the real economic variables (see Cagan (1969) and Leijonhufvud (1967)). The inver response of market interest rates towards changes in the money stock, known as the liquidit effect, plays a crucial role in explaining the transmission mechanism of the model. This initi reaction leads to a chain of adjustments in the real level of investment, output and employme The degree of these adjustments is highly dependent on two elasticity measures, namely; intere elasticity of the money demand function and the interest elasticity of the investment schedul Latane (1954) investigated the demand for money function for a period from 1919 to 195 He identified a stable behavioral relation between cash balances, income, and long term rate He noted that a 1% increase in long term rates reduces the amount of money balance held b 0.8%. Supporting Latane, Tobin (1956) verified the Keynesian liquidity preference functi using a hyperbolic function in depicting the relationship between money balances and intere rates. Another important feature of the Keynesian model is a de-emphasis on the role of monetar phenomenon in explaining an inflationary economy. Prices are assumed to be rigid, thus, allowi the real variables to change as money supply changes. According to Keynes, an increasing pri level is not a single monetary phenomenon but is an aggregate effect of many other factor including monetary and non-monetary events. Therefore, a variable growth rate of the mon supply can be a tool in stabilising the economy.

Opposite to the Keynesians, Monetarists adhere to the neutrality of money. Changes in the money supply will only create a transitory effect on the real variables. Over the long run, the economy restores to its natural level. The only lasting impact of changes in the money supply is on the price level. Friedman (1970), a prominent Monetarist, stated "in the short run, monetary changes affect primarily output, but over the long run, the rate of monetary growth affects primarily prices". Monetarists argue that the Keynesian model fails to take into account the long run effect of money supply changes. While agreeing on the liquidity effect, Friedman (1968) proved that the final impact of money supply changes on interest rates is beyond the liquidity effect framework. According to Friedman, as income rises the demand for money balances reduces and the reduction pushes interest rates upwards. This effect is known as the income effect. Further, public reaction to the changes in the price level causes them to anticipate higher price levels in the near future. As Fisher (1930) pointed out, the inflation expectation adds a premium to the current level of interest rates, aggravating the income effect. This third effect is known as the price level and anticipation effect. Friedman noted that the liquidity effect lasts for about 6 months before the income and the price level and anticipation effects emerge. On average, it takes about 18 months for the interest rate to restore to its original level. The adjustment speed is faster if the public correction of price levels takes a shorter time and if the money growth rate is persistently high in the previous years. These in turn are reflected in the level of efficiency in the market and the level of inflation the economy faced in the past. Contrary to the Keynesian model, the net effect of the money supply growth will increase the higher interest rate. According to Friedman, the counter-cyclical policies recommended by Keynes will lead the economy into a worse situation as compared to the pre-countercyclical level. Thus, based on this evidence, Friedman (1968) suggested an anticipated and constant money growth policy to be implemented. Large swings in the money supply growth are disastrous to the economy. Higher monetary growth is followed by higher interest rates and price levels and vice versa.

In a comprehensive study on the channels of monetary effects on interest rates, Cagan (1969, 1972) found a lag pattern of monetary effects which follows the sequence of liquidity income, and price level arguments. Using commercial paper rate, he concluded that the liquidity effect lasts for about 6 months after an increase in money supply. Further, he indicated that interest rates crossed the pre-monetary growth level after 16 months and finally settled at a higher level

than before. A shorter lag was reported when the Treasury bond and bills rates were used. Gibson and Kuafman (1968) examined the sensitivity of interest rates to changes in income and money in the post World War II period. Interest rates were found to be positively associated with income but negatively associated with money supply. The impact of changes in output was greater than the monetary growth. In addition, the output effect persisted over the long run while the money supply effect only lasted for 3 months and faded away after that. They concluded that interest rate was a poor indicator of monetary conduct and dismissed the effect of monetary growth on interest rates.

Brown and Santoni (1983) performed the regressions and causality tests between monthly interest rate changes and money supply changes for 4 periods; 1914-29, 1934-53, 1954-70, and 1971-82. Their results however are mixed. The liquidity effect is found in all periods except for the second period (1934-53). The income and price level effects are only evidenced in the last period. The short lived decline in the interest rate is followed by a series of significant positive responses toward changes in the monetary growth rate. It takes 12 months for the interest rate to adjust completely to a change in monetary growth. The causality between interest rates and money supply is one way in the third period (1954-70). Interest rates are exogenous to monetary growth rate while the monetary growth rate is endogenous to changes in interest rates. In the last period (1974-82) the causality is bi-directional. Both variables are causing each other. No significant causation pattern is identified for the first two periods. Thornton (1988) conducted a study measuring the responsiveness of interest rates to monetary changes using 3 different specifications which have been used in previous studies. These include, Distributed Lag model (Cagan and Gandolfi (1969), Browen and Santoni (1983)), the IS-LM model (Peek (1982), Hoffman and Schlogenhauf (1985)), and the Efficient Market model (Mishkin (1982), Hardouvelis (1986)). In addition, he employed 3 different measures of monetary growth: money supply (M_1), Adjusted Monetary Base, and Non-borrowed Reserves. He concluded that the response of interest rates is insensitive to the specification used; however, it is sensitive to the measurement of monetary growth. A significant negative effect is found when non-borrowed reserves are used as monetary variables. Further, he indicated that the negative response is more pronounced in a period where the Federal Reserve placed greater emphasis on the monetary aggregates in their policy conducts.

The development of the Malaysian financial market and its sophistication have undergone numerous changes since the country gained its independence in 1957. Prior to the formation of Bank Negara in 1959, monetary power was assumed by the Currency Board which was formed in 1897. The development of the Malaysian financial market is largely due to the policies implemented by the central bank in building the financial infrastructures which are critical for the development of the country as a whole. Prior to the mid 70s the financial market was characterised by a wide range of restrictive measures. According to Cargill, Cheng and Hutchinson (1986) financial liberalisation in Pacific Basin countries, including Malaysia, began in the mid 70s. The pace picked up after 1978 and continued throughout the eighties. By mid-1985, meaningful progress was made in freeing the market from restrictive measures. One of the important moves was the removal of interest rate restrictions. The restrictions were preserved throughout the region prior to the deregulation process. The authors highlighted the possible consequences of interest rate deregulation which is the risk of built-in bias for inflationary monetary policies. Coats (1979) evaluates alternative monetary rules which could be used in less developed countries. He warns against interest rate targeting, which, according to him, can led to excessive money supply growth and a hyperinflationary economy. If the monetary authority misjudges the appropriate equilibrium interest rate and persists in its targeted level, money supply and prices will move endlessly and explosively. Lanyi and Saracoglu (1983) discussed the importance of interest rate deregulation in a developing economy. It was shown that an attempt to hold down interest rates at a low level in the administered regime, aimed at stimulating growth, is a counterproductive policy. The unduly low nominal rate generates the negative real rate which deters savings and finally economic growth. Negative real rates of interest create excess aggregate demand, a rise in velocity, an acceleration of inflation and also foreign exchange shortages. The Malaysian policy not to hold the nominal rates at too low a level was commended. Between 1975 and 1980, real rates were positive and therefore contributed to a high rate of economic growth. Fry (1981) studied the effect of financial repression on credit availability in 7 Pacific Basin countries including Malaysia. Rigidity in nominal interest rates reduced the real rate of interest which finally affected economic growth negatively. According to Fry, a financially repressed economy should use both money supply and nominal interest rates as two independent policy instruments. A combination of monetary deceleration with interest rate increases could lower inflation and simultaneously raise the real rate of economic growth.

Hussin, Hee and Razi (1991) investigated the impact of financial liberalisation on interest rate behaviour in the Malaysian economy. In testing the data from 1978 to 1991 they found that Malaysian interest rates were largely influenced by external factors following the liberalisation process. Domestic monetary development appeared to have less effect on domestic interest rates which reduced the effectiveness of the monetary policy. Seng, Yaakop and Merriss (1986) examined the sensitivity of the Malaysian loans and deposit rates toward changes in interbank rates. After the deregulation process interest rates should be more market determined and the refore show greater response to changes in market conditions. Examining interest rates prior to and after 1978 they concluded that financial liberalisation has significantly increased the responsiveness of the loans and deposits rates to changes in interbank rates. Lee and Joa (1982) argued that money supply in the Malaysian economy is more an induced variable rather than active variable. This is largely due to the openness of the Malaysian economy which allows external factors to influence the domestic economy. Therefore, the balance of payment becomes a major factor that determines money supply in Malaysia. Aziz (1984) reports the upward adjustment of interest rates after the liberalisation process. He pointed that central bank intervention in the money market is largely aimed at smoothing the variations in interest rates rather than attempting to influence the underlying trend. A sharp increase in interest rates undermines business confidence and adversely affects the desired investment level. Deviations from foreign interest rates could also lead to capital flow instability which is undersirable for long term economic growth.

II. DATA AND METHODOLOGY

The data for the analyses are gathered from the monthly Statistical Bulletin issued by Bank Negara Malaysia (Central Bank of Malaysia). It involves monthly observations of money supply and money market rates over a period of 10 years (January 1980 to December 1989). The money supply measurement is represented by the nominal amount of the M_1 money circulated by the central bank. Three nominal money market rates are used, namely; T bill rate-3 months, Overnight rate and 7 day rate. The last two rates are measures of the KLIBOR (Kuala Lumpur Interbanks Offer Rates) which are widely quoted as the liquidity barometer of the Malaysian economy.

The statistical analyses conducted in this study are composed of three categories; Descriptive Statistics, Regression and Correlation Analyses, and Granger Causality Test. In descriptive

analysis, calculation of means, standard deviations and coefficients of variations are made for the full period (January 80-December 89) and 3 sub-periods (January 80-December 82, January 83-December 85, and January 86-December 89). The 3 sub-periods are chosen in order to trace the relationship in different cycles of interest rates and also the possibility of the lag effect of monetary growth. The regression and correlation analyses investigate the relationship of the current level of interest rate with the distributed lag of monetary growth. Twenty four months lags are included in the equation for capturing the lag effect of monetary growth on interest rates. The following specification and hypotheses are tested:

$$i_t = a + b_1M_{t-1} + b_2M_{t-2} + b_3M_{t-3} + \ldots\ldots\ldots\ldots b_{23}M_{t-23} + b_{24}M_{t-24} + e_t$$

H0: $b_{t-k} = 0$

H1: $b_{t-k} \neq 0$

where,

i_t : the money market rate at time t,

M_{t-k} : the monthly growth rate of money supply at time t–k,

b_{t-k} : coefficient of response for lag perid t–k,

k : lag term k = 1, 2, 3.....24,

a : constant term, and

e_t : randomly distributed error term at time t.

The Hildreth Lu grid search method is used to correct for the first order autocorrelation. Accepting the null hypothesis means that the interest rate is not affected by the monetary growth in time t–k. The alternative hypothesis indicates that the interest rate is influenced by the monetary growth in time t–k. A regression is run for each of the money market rates. A two tail t test at 95% confidence level is used to test the significance of the coefficient of response (b_{t-k}). The direction of response is reflected by the signs of the coefficients. Theoretically, it is expected that the coefficients carry negative signs for the initial lags reflecting the liquidity effect. After some lags the signs are expected to be positive, reflecting the income and price level effects.

The degree of linear association between current money market rates and past monetary growth is found by calculating the simple and partial correlation coefficients between the two variables. The coefficients are calculated as follows:

$$\text{Simple Correlation Coefficient, } r_{i(t)}M_{(t-k)} = \frac{\Sigma\,(i_t - U_i)\,(M_{t-k} - U_M)}{[\Sigma\,(i_t - U_i)^2\,\Sigma\,(M_{t-k} - U_M)^2]^{1/2}}$$

$$\text{Partial Correlation Ceofficient, } r_{i(t)}M_{(t-k)}.\ W = \left[\frac{R^2_u - R^2_{i(t)}W}{1 - R^2_{i(t)}W}\right]\ 1/2$$

where

i_t : interest rate at time t,

u_i : mean of interest rate,

M_{t-K} : monthly money growth rate at time t–k (k=1, 2,.....24)

u_M : mean of monthly money growth rate,

W : all other monthly money growth rates beside growth at t–k,

R^2_u : coefficient of determination of unrestricted regression which includes all 24 lags of money growth rates,

$R^2_{i(t)W}$: coefficient of determination of restricted regression which excludes money growth at t–k.

The partial correlation allows us to identify the linear association of a specific lag while eliminating the influence of other lags. Both of the coefficients range from -1 to + 1. A positive coefficient indicates a direct linear association between the monetary growth and current interest rate while a negative coefficient implies the reverse.

The Granger causality test is performed to examine the homogeneity of money supply growth. The result of the test defines the direction of causality between monetary growth and money market rates. The following unrestricted and restricted equations are tested using the ordinary least square (OLS):

Set 1:

Unrestricted $$i_t = \sum_{k=1}^{N} a_k i_{t-k} + \sum_{k=1}^{N} b_k M_{t-k} + e_t$$

Restricted $$i_t = \sum_{k=1}^{N} a_k i_{t-k} + e_t$$

H_0: Monetary growth does not cause interest rate changes

H_1: Monetary growth causes interest rate changes

Set 2:

Unrestricted $$M_t = \sum_{k=1}^{N} a_k M_{t-k} + \sum_{k=1}^{N} b_k i_{t-k} + e_t$$

Restricted $$M_t = \sum_{k=1}^{N} a_k M_{t-k} + e_t$$

H_0: Interest rate does not cause monetary growth.

H_1: Interest rate causes monetary growth.

The causality test is conducted for 4 different lags: 3, 6, 9, and 12 months. The F statistic is calculated for both sets. If the F statistic is greater than the critical F at 95% confidence level, the null hypothesis is rejected. Rejection of null hypothesis in the first set indicates that monetary growth causes changes in interest rate. Rejection of null hypothesis in the second set implies that interest rate causes changes in monetary growth. If the null hypotheses are rejected in both sets then bi-directional causality is proven. If only one of the null hypotheses is rejected then uni-directional causation is proven. Acceptance of the null hypotheses in both sets implies no significant causation exists between the two variables. Homogeneity of money supply growth is proven if the null hypothesis is rejected in the first set while accepted in the second set.

III. RESULTS AND DISCUSSIONS

Table 1 shows the descriptive statistics for the money supply and money market rates. Analysis of the date reveals two implications. First, a period of high growth in money supply is followed by a period of high interest rates and vice versa. The mean column suggests the possible lag effect of money growth. As can be seen, sub-period 1 is characterised by a high monetary growth rate period and this is followed by a high interest rate in sub-period 2. Conversely, a low monetary growth in sub-period 2 is followed by a low interest rate in sub-period 3. If the pattern

TABLE 1

DESCRIPTIVE STATISTICS OF MONETARY GROWTH AND MONEY MARKET RATES

	Mean	Standard Deviation	Coefficient of Variation
Full Period : Jan. 80 – Dec. 89			
M1 Growth	0.762	3.051	4.004
T Bill	4.362	0.924	0.212
Overnight	5.651	2.172	0.384
7 Day	6.864	2.852	0.416
Sub period 1: Jan. 80 – Dec. 82			
M1 Growth	0.906	2.918	3.221
T Bill	4.355	0.863	0.198
Overnight	5.410	1.489	0.275
7 Day	7.792	2.342	0.301
Sub period 2: Jan. 83 – Dec. 85			
M1 Growth	0.366	3.659	9.997
T Bill	5.013	0.201	0.040
Overnight	7.103	1.438	0.202
7 Day	8.331	1.650	0.198
Sub period 3: Jan. 86 – Dec. 89			
M1 Growth	0.951	2.662	2.799
T Bill	3.878	1.008	0.260
Overnight	4.744	2.500	0.527
7 Day	5.067	2.979	0.588

persists, we would expect the interest rate level in the early 1990s to be high due to high monetar growth in sub-period 3. In fact, this is what happened in the Malaysian economy in the earl 1990s. The high monetary growth from beginning of 1987 (averaging at 11.28% per year) associated by the decade's highest money market rates. By the end of 1990 the T bill discou rate reached 7.23% and the overnight rate and 7 day rate reached 6.79% and 6.77% respectivel Secondly, the lag effect of monetary growth is also experienced in the variability measure Policy which varies the monetary growth rate is associated by a high variability in the intere rate in the forthcoming period. This is evidenced by the coefficient of variation which sho low variability in monetary growth in sub-period 1, followed by low variability in the mon

market rates in sub-period 2. Conversely high variability of monetary growth in sub-period 2 is followed by a high variability of interest rates in the subsequent period. The pattern just identified does not answer the causality between the two variables. The descriptive analysis only describes a general relationship between money supply growth and money market rates.

The regression summaries are shown in Tables 2, 3 and 4 for each of the money market rates respectively. The poor relationship between Treasury bill and monetary growth is evidenced in Table 2. None of the coefficients are statistically different from zero. The high adjusted R2 and rho are due to high autocorrelation in the data. From this we can conclude that there is no significant relationship between the T bill and monetary growth rate. This is consistent with the existence of the captive market for T bills in the Malaysian financial market. A major portion of the outstanding bills is kept by commercial banks and held until maturity. The holding of the bills are merely to fulfill the liquid assets requirement imposed by the monetary authority. On the other hand, Tables 3 and 4 verify the interbank rates' role as the liquidity barometer in the Malaysian economy. The initial lags have a negative sign followed later by positive signs. However, only the first few lags are significantly different from zero. Increases in monetary growth reduces interbank rates and the effect lasts significantly up to 4 months. The rest of the coefficients are not significant. The correlation analysis in Table 5 supports the regression results. The simple correlation coefficients do not give a clear pattern of the linear association between the two variables. the partial correlation coefficients are able to isolate the impact of each lag and clearly show that interest rates are greatly associated with the first few lags in a negative direction. The correlation is weaker as the lag gets longer.

A closer look at the signs of the coefficients of response shows the dominance of the liquidity effect in the Malaysian financial market. Figure 1 shows the cumulative sum of the response coefficients. Clearly, the liquidity effect dominates the income and price level effects. An increase in the monetary growth is followed by a 13 month reduction in interbank rates before the income and price level effects emerge. The dominance of the liquidity effect is supported by the new level of interest rates which settles at a level lower than the previous level. As noted earlier the income and price level effects require efficiency in the market and are more pronounced in a high inflation economy. Little can be said about the efficiency of the Kuala Lumpur interbank rates since the subject matter has not been investigated thoroughly. However, the efficiency

FIGURE 1

LAG EFFECTS OF MONETARY GROWTH
ON MONEY MARKET RATES (1980 – 1989)

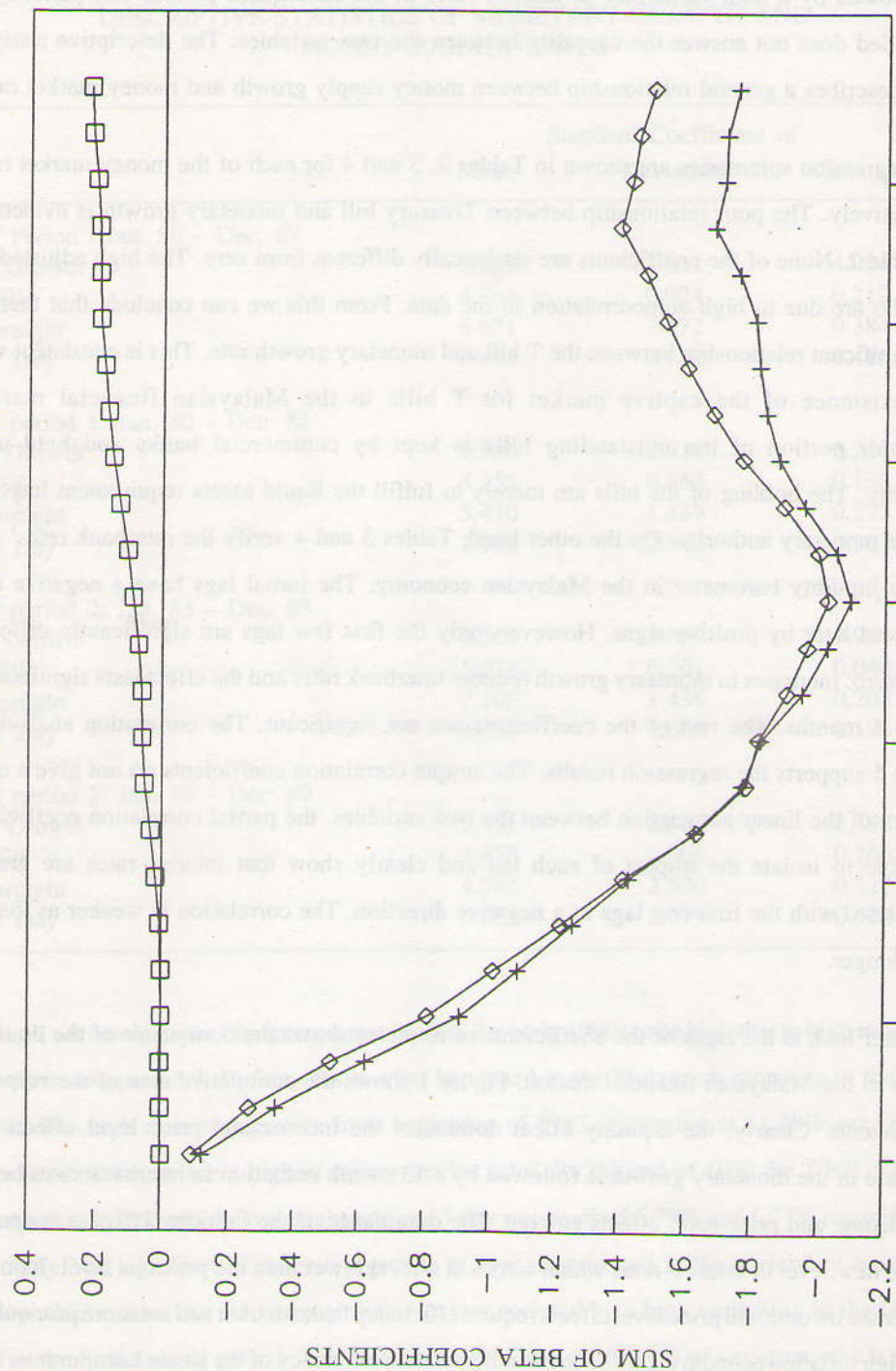

TABLE 2

REGRESSION OF T BILL RATES ON LAGGED VALUES OF MONETARY GROWTH RATES (JAN. 80 – DEC. 89)

Lag	Estimated Beta Coefficient	T Value	Cumulative Sum of Beta Coefficients
1	–0.002	–0.193	–0.002
2	0.003	0.222	0.002
3	0.001	0.048	0.003
4	–0.003	–0.104	0.000
5	0.002	0.059	0.002
6	0.005	0.150	0.006
7	0.012	0.354	0.018
8	0.016	0.474	0.034
9	0.018	0.516	0.053
10	0.006	0.153	0.059
11	0.003	0.074	0.061
12	0.009	0.244	0.070
13	0.017	0.450	0.088
14	0.018	0.490	0.106
15	0.023	0.623	0.129
16	0.020	0.552	0.149
17	0.014	0.412	0.164
18	0.013	0.392	0.177
19	0.013	0.402	0.190
20	0.001	0.035	0.191
21	0.002	0.074	0.193
22	0.009	0.377	0.202
23	0.013	0.610	0.215
24	0.005	0.321	0.220
Constant	4.401	4.947	
Adjusted R Square	0.947		
F Statistic	68.946*		
Std. Error of Estimate	0.211		
Rho	0.980		

Corrected for first-order autocorrelation.
*Significantly different from zero at the 95% confidence level.

TABLE 3

REGRESSION OF OVERNIGHT RATES ON LAGGED VALUES OF MONETARY GROWTH RATES (JAN. 80 – DEC. 89)

Lag	Estimated Beta Coefficient	T Value	Cumulative Sum of Beta Coefficients
1	–0.124	–1.880	–0.124
2	–0.221	–2.313*	–0.346
3	–0.279	–2.491*	–0.624
4	–0.285	–4.417*	–0.909
5	–0.180	–1.457	–1.089
6	–0.173	–1.395	–1.262
7	–0.172	–1.382	–1.434
8	–0.196	–1.587	–1.630
9	–0.144	–1.169	–1.774
10	–0.055	–0.447	–1.829
11	–0.122	–1.022	–1.950
12	–0.074	–0.663	–2.025
13	–0.070	–0.634	–2.095
14	0.042	0.359	–2.052
15	0.095	0.759	–1.958
16	0.077	0.609	–1.880
17	0.040	0.316	–1.840
18	0.022	0.177	–1.818
19	0.010	0.081	–1.808
20	0.050	0.047	–1.758
21	0.074	0.592	–1.684
22	–0.030	–0.251	–1.714
23	–0.005	–0.045	–1.719
24	–0.033	–0.347	–1.752
Constant	6.989	7.54*	

Adjusted R Square	0.576
F Statistic	6.151*
Std. Error of Estimate	1.480
Rho	0.700

Corrected for first-order autocorrelation.

*Significantly different from zero at the 95% confidence level.

TABLE 4

REGRESSION OF 7 RATES ON LAGGED VALUES OF MONETARY GROWTH RATES (JAN. 80 – DEC. 89)

Lag	Estimated Beta Coefficient	T Value	Cumulative Sum of Beta Coefficients
1	–0.093	–1.409	–0.093
2	–0.172	–1.698	–0.265
3	–0.252	–1.992*	–0.517
4	–0.295	–2.091*	–0.812
5	–0.200	–1.298	–1.013
6	–0.212	–1.320	–1.224
7	–0.193	–1.177	–1.417
8	–0.218	–1.318	–1.635
9	–0.149	–0.903	–1.784
10	–0.036	–0.221	–1.820
11	–0.086	–0.540	–1.906
12	–0.060	–0.399	–1.966
13	–0.062	–0.411	–2.028
14	0.029	0.187	–1.999
15	0.104	0.633	–1.984
16	0.123	0.733	–1.772
17	0.090	0.536	–1.682
18	0.081	0.484	–1.601
19	0.062	0.377	–1.539
20	0.058	0.362	–1.480
21	0.081	0.518	–1.400
22	–0.035	–0.249	–1.435
23	–0.021	–0.161	–1.456
24	–0.044	–0.438	–1.500
Constant	7.699	4.851*	
Adjusted R Square	0.731		
F Statistic	11.345*		
Std. Error of Estimate	1.461		
Rho	0.840		

Corrected for first-order autocorrelation.
*Significantly different from zero at the 95% confidence level.

TABLE 5

SIMPLE AND PARTIAL CORRELATION COEFFICIENTS BETWEEN MONEY MARKET RATES AND LAGGED VALUES OF MONETARY GROWTH (JAN. 80 – DEC. 89).

	Simple Correlation			Partial Correlation		
Lag	T BIll	Overnight	7 Day	T Bill	Overnight	7 Day
1	–0.007	–0.159	–0.122	–0.023	–0.219	–0.166
2	–0.009	–0.176	–0.140	0.027	–0.266	–0.199
3	–0.016	–0.141	–0.124	0.006	–0.285	–0.232
4	–0.010	–0.025	–0.037	–0.012	–0.278	–0.242
5	–0.003	–0.083	–0.081	0.007	–0.172	–0.153
6	0.014	–0.092	–0.001	0.018	–0.164	–0.156
7	0.033	–0.057	–0.041	0.042	–0.163	–0.139
8	0.040	–0.011	0.131	0.057	–0.186	–0.156
9	0.031	0.096	0.061	0.062	–0.138	–0.107
10	0.035	–0.069	–0.056	0.018	–0.053	–0.026
11	0.035	–0.012	–0.034	0.009	–0.121	–0.064
12	0.056	–0.113	–0.076	0.029	–0.079	–0.048
13	0.066	–0.068	–0.051	0.054	–0.076	–0.049
14	0.072	–0.020	–0.014	0.058	0.043	0.022
15	0.066	–0.016	0.009	0.074	0.090	0.076
16	0.059	–0.011	–0.013	0.066	0.073	0.087
17	0.072	0.011	0.030	0.049	0.038	0.064
18	0.100	–0.019	–0.006	0.047	0.021	0.058
19	0.089	0.016	–0.004	0.048	0.010	0.045
20	0.094	0.119	0.082	0.004	0.047	0.043
21	0.111	–0.004	–0.013	0.009	0.071	0.062
22	0.110	0.075	0.044	0.045	–0.030	–0.030
23	0.106	0.009	–0.001	0.073	–0.005	–0.019
24	0.124	–0.013	–0.018	0.038	–0.042	–0.052

of the interbank market in the early eighties is doubted as interest rate determination is largely controlled by the central bank. In addition, the existence of few leading banks in the banking industry could also affect the efficiency of the interbank rates. The liberalisation of interest rate determination in the late eighties towards a market determined system might have contributed towards greater efficiency in the interbank market. Malaysia is characterised by a low inflation economy, averaging at 2.92% throughout the 1980s. Therefore, the income and price level effects are not so pronounced as compared to the high inflation economy. These conditions allow the monetary authority to use money supply as a tool in their counter-cyclical policy to stabilise the economy.

The results seem to indicate that Keynes economic principle might be applicable in the Malaysian economy. Counter-cyclical policies are effective as long as the income and price expectation effects are smaller, relatively, to the liquidity effect. However, is should be noted that the income and price expectation effects do exist in the Malaysian economy. As discussed earlier the financial liberalisation that took place in the late eighties has tremendously affected the behaviour of Malaysian interest rates. There is high possibility that these strutural changes might affect the efficiency of money market rates in coming years. This in turn affects the magnitude of the income and price expectation effects in the Malaysian economy. Therefore, the results of this study should not be taken as supporting evidence for the application of Keynes economic theory in the Malaysian economy. It is important to note that the policy chosen should be forward looking and not solely based on previous experience.

The results of the Granger causality test are shown in Table 6. The homogeneity of money supply is not valid in the Malaysian economy. Only one lag period (T bill-3 months lag) shows that money supply causes changes in interest rates. Generally, the result shows that the causality is uni-directional, running from interbank rates to monetary growth. Monetary growth does not cause changes in interest rates but interest rates do cause changes in monetary growth implying an interest rate targeting policy being adopted. The result is consistent with the policies practised in Malaysia. The monetary authority maintains close supervision of the interbank market. Monetary measures are employed to sustain the targeted level of interest rates. The central bank intervenes in the interbank market if it feels that interest rates are moving in the wrong direction. The F statistics for the interbank rates at all lags are significant at 95% confidence level. Thus, interbank rates can be used as an indicator of the likely monetary policy changes in the Malaysian economy.

IV. SUMMARY AND CONCLUSION

TABLE 6

GRANGER CAUSALITY TESTS

	Lag	F Statistic Set 1	F Statistic Set 2
T Bill	3	2.424*	0.377
	6	1.006	2.054*
	9	0.987	1.002
	12	1.297	2.354*
Overnight rate	3	0.545	2.142*
	6	0.873	3.212*
	9	1.195	2.668*
	12	0.877	3.370*
7 Day rate	3	0.290	3.871*
	6	1.151	1.021
	9	0.783	3.331*
	12	0.862	1.350*

* Significantly different from zero at the 95% confidence level

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