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THE DEMAND FOR CURRENCY AND DEMAND DEPOSITS IN MALAYSIA: AN EMPIRICAL EVIDENCE

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I. INTRODUCTION

For most of the years since independent the focus of monetary policy, has been on the money stock, M1, as an indicator or guide to monetary policy (Quarterly Economic Bulletin, 1985, pp. 122). This has happened despite the experience of rapid growth and innovations in the financial sector[1]. These structural changes or innovations in the financial system have significant implications on money demand, one of which is on its stability (Judd and Scadding, 1982).

The objective of this study is to determine empirically the factors affecting the demand for the monetary components of M1. This is important given the concern of the Central Bank in recent years on the behaviour and the stability of M1 as a policy tool following the rapid growth and innovations in the financial sector, where a shift out of currency holdings and demand deposits into interest-bearing deposits has been noted (Economic Report, 1985, pp. 109). As a result, the role of money M1 as an indicator for monetary policy purposes can be questioned.

This paper is divided into five sections. In section two, some background on financial development in Malaysia will be discussed, and models used in this study will be presented in section three. Results of regression analyses will be reported in section four, and the final section contains some conclusions.

II. AN OVERVIEW OF MONETIZATION AND FINANCIAL DEEPENING IN MALAYSIA

The development of the financial system assumes an important role for economic growth and for purposes of monetary policy. In fact, expansion in

[1]Several of such innovation are the emergence of non-bank financial intermediaries (NBFI), interest-bearing financial assets, deregulation, and the spectrum of interest rates with different maturity dates offered (see next section for an overview).

money supply is inevitable if economic growth and development are to lead to rising output over time (Chandavarkar, 1973). Following increases in GNP the demand for money to mediate the increasing volume of economic activity also increases since the monetization of the subsistence sector in the economy requires additional money. As the process of monetization increases, asset-differentiation takes place leading to growth not merely of money but also of quasi-money (for example, savings and time deposits with banks) and financial assets. This asset-differentiation is important for the development process, because once the limits of self-finance are reached the (net) investing units have to raise external funds through sale of financial intruments to the (net) saving units in the economy. It is at this stage that the process and policy of financial intermediation is peculiarly relevant for the developmental process.

The degree of monetization and the level of financial deepening in Malaysia can be observed in Table 1. Indicators of the degree of monetization includes ratios of money supply (M1, M2 and M3) to GNP. Over the years from 1960 to 1984, the ratio of M2/GNP and M3/GNP has been on an increasing trend, however, the M1/GNP ratio has been decreasing. The rapid process of monetization can also be shown by ratios of M2/M1 and M3/M2. The growth of M2 over M1 as indicated by the ratio M2/M1 also shows the significance of the banking system in this country. The growth of the non-bank financial intermediaries is shown by the ratio of M3 to M1, which is on an increasing trend. The process of financial deepening in the Malaysian financial system can be seen in the relationships between the total assets of

TABLE 1
Monetization And Financial Deepening In Malaysia, 1960-1984

	1960	1970	1980	1984
M1/GNP	0.19	0.17	0.19	0.18
M2/GNP	0.28	0.37	0.55	0.66
M3/GNP	0.40	0.61	0.88	1.20
M2/M1	1.46	2.14	2.34	3.58
M3/M1	1.44	1.64	1.59	1.80
Financial Asset/GNP	0.58	1.00	1.48	2.05
Banking/Assets/GNP	0.38	0.64	1.08	1.47

Source : Figures calculated from various issues of Bank Negara Malaysia, Quarterly Economic Bulletin.

the financial system and the nation's GNP. The ratio of the assets of the financial system to GNP rose from 0.58 in 1960, to 2.05 in 1984; showing the significance of non-bank financial intermediaries and the changes in financial sophistication in the country. The dominance of the banking system (comprising the Central Bank and the commercial banks) in the Malaysian financial system is thus evident, as the banking system's assets/GNP ratio rose from 0.38 in 1960 to 1.87 in 1984.

The trend in the currency and demand deposit holdings is given in Figures (1) to (9). It can clearly be seen that there is a shift such that commercial bank's saving and fixed deposits are substitute for currency and demand deposit as shown by the decreasing trend in the M1 to M2 ratio. At the same time, the substitutability of the liabilities of the non-bank financial institutions for money (currency and demand deposit) are shown by the decelerating trend in the M1 to M3 ratio. The trends can be taken to indicate that the public prefer to hold money in interest-bearing financial assets offered by commercial banks and non-bank financial institutions rather than holding cash due to the competitive rates offered by the commercial banks and non-bank financial institutions. In fact, upon comparing currency and demand deposits, the public seem to prefer holding demand deposits as shown by the decreasing trend in the ratio of currency to demand deposits (Figure 1), and the increasing trend in the ratio of demand deposits to M1 (Figure 5).

III. THE MODEL

There have been a number of studies on the demand for money in Malaysia. These studies, however, have all centered on determining factors affecting the Malaysia money stocks, M1, M2 and M3 (Semudram, 1981; Yahya, 1984a, 1984b; Spencer and Yahya, 1985; Ghaffar and Habibullah, 1987a, 1987b, 1987c; Yusoff, 1987; Anuar, 1986). To date there have been no study on factors affecting the monetary aggregates or components and this study is an attempt to fill in this gap.

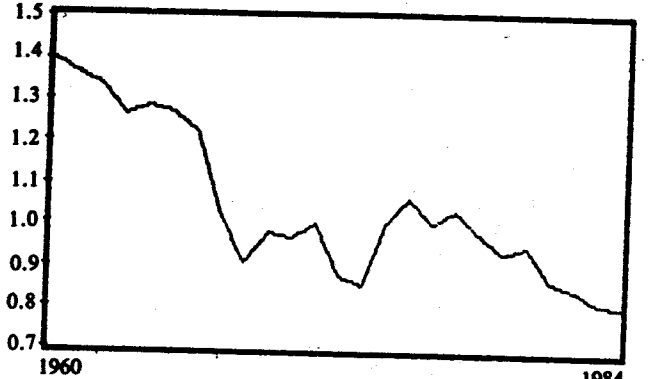

Figure 1 : Ratio Of Currency To Demand Depostis

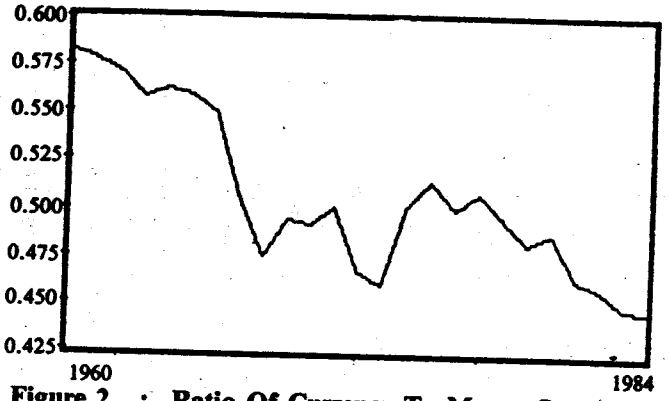

Figure 2 : Ratio Of Currency To Money Stock M1

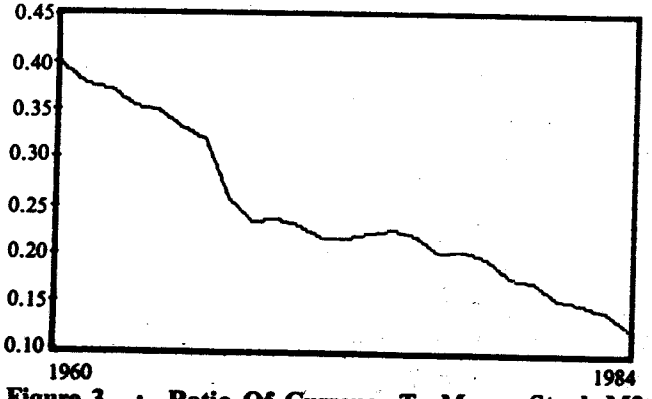

Figure 3 : Ratio Of Currency To Money Stock M2

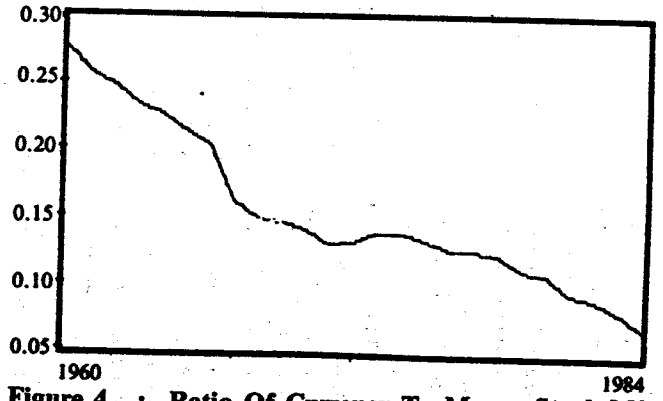

Figure 4 : Ratio Of Currency To Money Stock M3

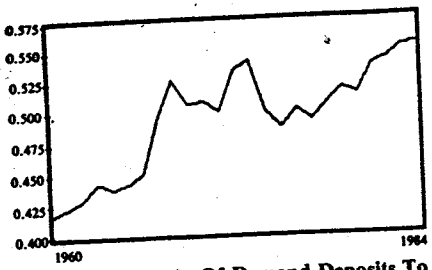

Figure 5 : Ratio Of Demand Deposits To Money Stock M1

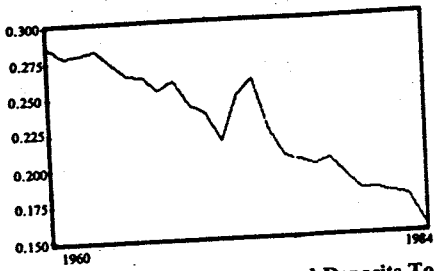

Figure 6 : Ratio Of Demand Deposits To Money Stock M2

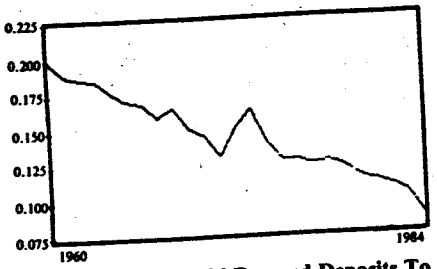

Figure 7 : Ratio Of Demand Deposits To Money Stock M3

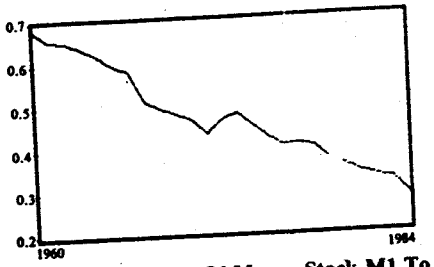

Figure 8 : Ratio Of Money Stock M1 To M2

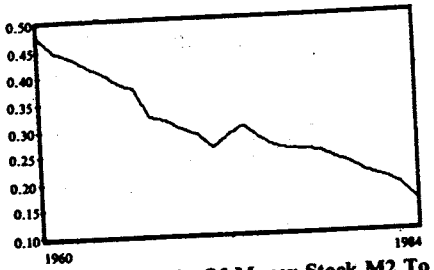

Figure 9 : Ratio Of Money Stock M2 To M3

Following Ott et. al. (1975), the demand for monetary aggregates is assumed to take the form of the demand for money function. In this study we employ the model for the Malaysian money demand function for M1, given by Ghaffar and Habibullah (1987c) as

$$m_t^* = f(y_t, P_t, r_{it}, r_{Mt}) \tag{1}$$

where m_t^* is the desired real money balances, y is the real income level, r is short-term interest rate, r_{Mt} is the rate of return on money M1, and P_t is the rate of inflation. Defining M1 as currency in circulation (CC) plus demand deposit held by non-bank private sector (DD), and taking into account the substitutability among the monetary components, we have the following demand for money M1 compenents (Lee, 1966, 1967):

$$m_{kt}^* = f(y_t, P_t, r_{it}, r_{Mt}, r_{at}) \tag{2}$$

where k refers to currency in circulation or demand deposits, and r_{at} is the rate of return on alternative interest-bearing financial assets.

Since there is a time lag for individual to adjust their money holding from the desired level m_t^*, to actual level m_t, the following adjustment process is assumed (Chow, 1966):

$$m_{kt} = m_{kt-1} = \theta (m_{kt}^* - m_{kt-1}) \tag{3}$$

where θ is the adjustment coefficient.

However, for estimation purposes, we define equation (2) in log-linear form, substitute it into equation (3), and after rearranging terms, we arrive at the final estimating model;

$$\log m_{kt} = \alpha_0 + \alpha_1 \log y_t + \alpha_2 \log P_t + \alpha_3 \log r_{it} + \alpha_4 \log r_{Mt} + \alpha_5 \log r_{at} + \alpha_6 \log m_{kt-1} + \mu_{kt} \tag{4}$$

where α's are the parameters to be estimated, and μ_{kt} is the disturbance term.

IV. METHOD OF ESTIMATION AND DATA

This study employs Malaysian annual data for the period 1960 to 1984. The scale variable is proxied using gross national product deflated by the

consumer price index (1967 = 100). The short-term interest rate r_{lt} is represented by the 6-month Treasury bill rate (RTB6). The rates of return on interest bearing financial assets are proxied by commercial bank's saving (BRSD) and fixed deposit rates [3 month (BRFD3), 6-month (BRFD6), 9-month (BRFD9) and 12 month (BRFD12)], finance company's saving (FCRSD) and fixed deposit rates [3-month (FCRFD3), 6-month (FCRFD6), 9-month (FCRFD9) and 12 month (FCRFD12)], and National Saving Bank's saving deposit rate (NSBDR). However, the rate of return on money M1, is proxied using the following formula

$$r_M = \{r_L - [(r_L/(r_{SD} + r_{FD})]\}(DD/BA) \quad (5)$$

where r_m is the rate of return on M1, r_L, is the rate on commercial bank's loans and advances, r_{SD} and r_{FD} are commercial banks's saving and fixed deposit rates, DD is demand deposits and BA is total commercial bank's assets. The rate of inflation is measured by using the growth rate in the consumer price index (CPI, 1967 = 100). All data are compiled from various issues of Bank Negara's Quarterly Economic Bulletin.

In this study there are twenty four specifications to be estimated. For all equations, the maximum likelihood method of estimation due to Beach and MacKinnon (1978) were used.

V. THE EMPIRICAL RESULTS

In this study we have tried to include all the variants of the interest rates of the interest-bearing financial assets in the final estimation. However, the results are rather discouraging due to milticollinearity between these interest-bearing assets. As such in the final estimation we have estimated the model by incorporating the interest-bearing assets separately.

The Demand for Currency

Results of the estimated regression equation for currency demand are presented in Table 2. In all cases the results show that the goodness of fit is satisfactory. For equations (1), (3), (7) and (12), all variables are important as shown by the significance of the 't-statistics'. All variables have the expected signs except for $NSBDR_t$ which has positive sign. However, for equations (2), (5), (6), (8), (9), (10) and (11) variables r_{Mt} and r_{at} were insignificant.

The strong relationship between the explanatory variables and the amount of currency held by the public can be seen by the significance of most of the estimated parameters (at one percent level). Nevertheless, overall results suggest

TABLE 2
REGRESSION RESULTS OF THE DEMAND FOR CURRENCY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	−1.5187	−1.0475	−1.9690	−1.9433	−1.9286	−1.6799	−1.2657	−2.0044	−1.8161	−1.9369	−1.8266	−1.9561
	(−4.0712)***	(−2.2129)**	(−5.1785)***	(−4.5722)***	(−4.3727)***	(−3.3551)***	(−3.1287)***	(−2.0621)	(−2.3131)**	(−2.8832)**	(−2.7298)**	(−2.9768)**
y_t	0.51296	0.36979	0.62139	0.62736	0.63901	0.56593	0.40558	0.61822	0.58432	0.63881	0.61850	0.65267
	(5.1313)***	(2.8891)**	(6.6827)***	(5.6770)***	(5.2255)***	(3.8368)***	(3.7049)***	(2.2405)*	(2.5897)**	(3.2695)**	(3.1390)**	(3.3873)***
P_t	−1.0215	−1.3689	−0.90628	−0.90977	−0.76090	−9.91626	−1.1032	−1.4530	−1.1477	−1.1057	−1.0688	−1.1101
	(−3.1004)***	(−3.5149)***	(−3.1272)***	(−2.9313)***	(−2.2171)**	(−2.2896)**	(−3.5559)***	(−3.0610)**	(−2.7305)**	(−3.0255)**	(−2.8468)**	(−3.0937)**
$RTB6_t$	−0.31204	−0.35597	−0.18513	−0.20670	−0.19366	−0.26981	−0.32851	−0.20068	−0.16942	−0.14384	−0.15760	−0.15543
	(−3.9573)***	(−4.6446)***	(−2.1470)**	(−2.1441)**	(−1.7721)*	(−2.3180)**	(−4.7722)***	(−1.8150)	(−1.6120)	(−1.6170)	(−1.7865)	(−1.8713)*
r_{MI}	0.52415	0.69004	0.60943	0.59691	0.56230	0.53702	0.57062	0.69126	0.61464	0.59492	0.58019	0.60068
	(4.3350)***	(4.0323)***	(5.3070)***	(4.9240)***	(4.6955)***	(4.2460)***	(4.9131)***	(3.3297)**	(3.2474)**	(3.6048)***	(3.4262)***	(3.7130)***
$BRSD_t$		0.16255										
		(1.7018)										
$BRFD3_t$			−0.14667									
			(−2.2115)**									
$BRFD6_t$				−0.13764								
				(−1.6325)								
$BRFD9_t$					−0.14204							
					(−1.4639)							
$BRFD12_t$						−0.05915						
						(−0.50217)						
NSBOR							0.11292					
							(1.9564)					
$FCRSD_t$								−0.12759				
								(−1.4105)				
$FCRFD3_t$									−0.11399			
									(−1.9426)*			
$FCRFD6_t$										−0.16318		
										(−2.7430)**		
$FCRFD9_t$											−0.17015	
											(−2.6250)**	
$FCRFD12_t$												−0.17080
												(−2.8487)**
$(CC/CPI)_{t-1}$	0.68829	0.73167	0.65438	0.64461	0.62051	0.66159	0.73076	0.66038	0.64840	0.61573	0.63121	0.61212
	(6.9234)***	(8.1377)***	(8.7820)***	(7.4358)***	(6.4270)***	(5.7399)***	(8.8840)**	(3.2171)**	(3.5237)***	(3.9816)***	(3.9938)**	(4.0032)**
R^2	0.9928	0.9956	0.9973	0.9959	0.9955	0.9927	0.9968	0.9985	0.9991	0.9994	0.9994	0.9994
D.W.	1.8681	1.9278	1.5579	1.6706	1.7101	1.8611	1.8450	2.1049	2.3820	2.4480	2.4622	2.4079
d.f	18	17	17	17	17	17	17	8	8	8	8	8

Notes : *** Statistically significant at the one percent level
** Statistically significant at the five percent level
* Statistically significant at the ten percent level
Figures within bracket are t-statistics.

that an increase in income. will ultimately increase the public's holding of currency for transaction purposes. The positive relationship between currency and the variable r_M implies that the public holds currency for 'convenience services' provided for transaction purposes. The results also suggest that an increase in inflation rate is associated with the reduction of currency holdings. The rate of inflation itself can be thought of as the rate of return on real assets. A negative relationship implies that as rate of return on real assets increases, public will accumulate durable goods. On the other hand, the substitutability of the interest-bearing financial assets are shown by the negative relationships between currency and RTB6, BRFD3, FCRFD3, FCRFD6, FCRFD9 and FCRFD12. Further, previous level of currency also affects the public holding for currency.

The Demand for Demand Deposits

Table 3 presents the regression results of the demand for demand deposits. Similar to currency, the goodness of fit is satisfactory. The results suggest that no single estimated equation show that all variables are important. In most cases, in each of the estimated equation, at least one variables is insignificant. Nevertheless, overall the results suggest that all important variables have the expected sign, except for BRFD12 in equation (6) which obtained positive sign. The overall results also suggest that income level, inflation rate, the 'convenience services' provided by demand deposits and the previous level of demand deposits affect public holding of demand deposits. The substitutability of interest-bearing assets is only shown by 6-month Treasury bill rate. The insignificance of most of the interest rate on saving and fixed deposits of the financial institution imply that there is no clear-cut categorization of whether interest bearing assets are substitutes or complements for demand deposits.

VI. CONCLUSION

The objective of the study has been to determine factors affecting the behaviour of public holding for currency and demand deposits. The results suggest that income level, inflation rate, short-term interest rate on financial assets, the 'convenience services' rendered by currency and demand deposit for transaction purposes, and the previous level of currency and demand deposits affect the demand for currency and demand deposits. On the other hand, the liabilities of commercial banks and non-bank financial institutions only affect the public holding for currency but not demand deposits. The results also suggest that the emergence of the liabilities of commercial banks and non-bank financial institutions resulted in the shift out of currency holding to demand deposits and other interest-bearing assets. Therefore, the instability

TABLE 3
REGRESSION RESULTS OF THE DEMAND FOR DEMAND DEPOSITS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	−2.5751	−2.2491	−2.3491	−2.2289	−1.9774	−1.7464	−2.6415	−4.3059	−4.2633	−4.2451	−4.2583	−4.2619
	(−2.7991)**	(−2.4011)**	(−2.4819)**	(−2.3729)**	(−2.2003)**	(−2.0931)*	(−2.7716)**	(−2.7336)**	(−2.9028)**	(−2.8775)**	(−2.9028)**	(−2.9028)**
y_t	0.90181	0.82183	0.84255	0.81412	0.74285	0.68787	0.92107	1.1597	1.1563	1.1436	1.1525	1.1556
	(3.2337)***	(2.9992)***	(2.9795)***	(2.9261)***	(2.8303)**	(2.8624)**	(3.1827)***	(2.7921)**	(2.9283)**	(2.8713)**	(2.8860)**	(2.8686)**
P_t	−0.71890	−0.87821	−0.65935	−0.59145	−0.69356	−0.86315	−0.72760	−2.5276	−2.4248	−2.4247	−2.4243	−2.4232
	(−1.2704)	(−1.4429)	(−1.1488)	(−1.0422)	(−1.2679)	(−1.6661)	(−1.2495)	(−2.1996)*	(−2.4258)**	(−2.4133)**	(−2.4141)**	(−2.4200)**
$RTB6_t$	−0.27872	−0.28969	−0.33225	−0.34499	−0.41627	−0.46254	−0.27817	−0.24793	−0.25644	−0.26703	−0.25992	−0.25763
	(−2.7704)**	(−2.3698)**	(−2.2492)**	(−2.4091)**	(−2.9425)***	(−3.6620)***	(−2.2026)**	(−1.1111)	(−1.2257)	(−1.2549)	(−1.2137)	(−1.2079)
r_{SB}	0.29871	0.22325	0.26369	0.23023	0.21667	0.15055	0.30595	1.1332	1.0960	1.1012	1.0977	1.0973
	(1.8047)*	(1.2612)	(1.5264)	(1.3086)	(1.3191)	(0.98031)	(1.7949)*	(2.5988)**	(2.7850)**	(2.7795)**	(2.7765)**	(2.7927)**
$BRSD_t$		0.13980										
		(1.99827)										
$BRFD3_t$			−0.07854									
			(−0.63802)									
$BRFD6_t$				−0.10567								
				(−0.83847)								
$BRFD9_t$					0.18717							
					(1.5837)							
$BRFD12_t$						0.28597						
						(2.4511)**						
NSBOR							0.2271					
							(−0.2170)*					
$FCRSD_t$								−0.04063				
								(−0.20760)				
$FCRFD3_t$									−0.00787			
									(−0.05480)			
$FCRFD6_t$										−0.01984		
										(−0.11390)		
$FCRFD9_t$											0.00113	
											(−0.00596)	
$FCRFD12_t$												−0.00619
												(−0.03342)
$(CC/CPI)_{t-1}$	0.37689	0.35470	0.39198	0.39359	0.42176	0.40949	0.37670	0.38207	0.36374	0.36598	0.36431	0.36395
	(1.5396)	(1.4339)	(1.5894)	(1.6121)	(1.8620)	(1.9811)*	(1.4765)	(1.0736)	(1.0330)	(1.0353)	(1.0358)	(1.0350)
R^2	0.9894	0.9921	0.9916	0.9928	0.9950	0.9965	0.9887	0.9661	0.9638	0.9649	0.9641	0.9641
D.W.	1.9588	1.9390	1.9648	1.9165	2.0002	2.0423	1.9715	1.7486	1.7537	1.7395	1.7504	1.7537
d.f	18	17	17	17	17	17	17	8	8	8	8	8

Notes : *** Statistically significant at the one percent level
** Statistically significant at the five percent level
* Statistically significant at the ten percent level
Figures within bracket are t-statistics.

of the demand for money M1 can be taken to be due to the reduction in the public's holding in currency, rather than demand deposits. This is practically true in this country since with the rapid expansion in computerisation, the emergence of automatic teller machines made demand deposits more flexible and attractive then currency. As a matter of fact, 'plastic money' to a certain extent is preferred to carrying bulky notes and coins or cheque books.

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