THE DEMAND FOR MONEY IN TRINIDAD AND TOBAGO - EXPERIMENTS WITH DATA FOR THE 1970-84 PERIOD.

by

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The demand for money function has a long history. Much of the controversy raging today, however, dates back to the 1950's with the revival of the quantity theory of money and the propositions that sprung from it. Until the early 1970's the econometric studies done on the developed countries (particularly the U.S. and the U.K.) had concluded that the demand for money was a stable function of a few key variables relating to income, prices and interest rates. The conclusion of temporal stability was to a large extent accepted on the basis of the ability of the particular specifications to predict the demand for money with a high degree of accuracy rather than on the basis of rigorous statistical tests. The tendency of the accepted function to over-predict money demand since the early 1970's has brought into question the whole issue of stability; and since this stability is crucial to the conduct of monetary policy, the search for an explanation for the apparent downward shift in money demand has been frantic.[1] While some see the explanation in a parametric movement (i.e. a parallel movement of the function), others suspect the ommission of crucial variables from the equations, particularly in the context of regulatory and other changes.[2]

Because of differences in structure and environment, there are likely to be significant differences in the value of coefficients relating to different countries. Given the problems with data, studies done on developing countries have tended to be more uncertain in their conclusions. A different 'fit' in a recent period may simply reflect improvements in the quality of the data, rather than fundamental changes in the underlying conditions. Also, published data relating to particular variables may not accurately reflect supply/demand conditions or actual developments and, therefore, could be quite misleading. In interpreting the econometric results in this paper these difficulties need to be kept in mind. Our purpose is not so much to investigate stability or instability in the money demand function as to explore possible specifications which could best explain the demand for money in Trinidad and Tobago in the period between 1970 and 1984. The paper is divided into four sections. In the first we outline the main theoretical perspectives bearing on the demand for money function. We shall not examine the whole range of theoretical and empirical literature since that has been done elsewhere.[3] In the second we discuss recent trends in supply (demand) for money in Trinidad and Tobago. In the third we outline some of the econometric problems involved in estimating a money demand function. In the final section we discuss the empirical results of the study.

Theoretical Perspectives

Early versions of the quantity theory assumed that money and velocity were independent of each other. In other words changes in the quantity of money were not offset by movements in velocity which was assumed to be fairly stable - at least in the short term. Following Keynes, modern Keynesians take the position that a change in the money supply may or may not affect income (the real sector), and if it does, it would be indirectly through some transmission mechanism such as the rate of interest. A rise in the money supply may be offset by a fall in velocity (a rise in money demand), thus leaving nominal income unchanged. On the basis of a presumed stability in money demand in the short term, monetarists argue that if the money market is in equilibrium, a rise in the money supply must generate an increase in the level of income to remove the excess supply of money.

In the Classical system money was assumed to be held only for transaction purposes, or as a medium of exchange. In the Fisherian version of the quantity theory, the emphasis was placed on the transaction velocity or the need to hold money. The Cambridge or cash balance version was framed in terms of what determines the amount of money people wish to hold. The Cambridge School argued that money is held with a view to making payments now and in the future. "Money is seen to have a utility value for its holders, providing security and convenience. The demand for money, therefore, is influenced not only by the volume of payments or the level of income, but by an assessment of the utility of holding cash balances weighed against the utility of buying consumption goods and the utility of the yield of other assets."[4] Keynes broke the new ground by arguing that money could be held in idle balances for speculative purposes. He divided money demand in terms of three motives. Transactions demand, precautionary demand and speculative demand.[5] The transactions demand encompassed both an income motive and a business motive. For Keynes, the major influence on the transactions demand for money were the level of income and certain institutional and mechanistic factors. Although he thought that the rate of interest might be another influence, this was considered to be of only minor influence. ?

The rate of interest had more relevance to the speculative demand for money, which arose from uncertainty about the future level of the rate of interest. Keynes' analysis provided two alternative ways of holding financial assets: money (whose value was fixed, given the assumption of a stable price level) and long term bonds (whose value would vary with changes in the rate of interest). He argued that in certain circumstances, money would be held in preference to an interest yielding asset if it is expected that the return from money would exceed that from the asset.

Keynes' money demand analysis was considered to be defective in several respects, and there were subsequent attempts by a number of people (e.g. W.J. Baumol and J. Tobin) to correct these. Major weaknesses include:

(i) *The splitting-up of the demand for money function due to the independence of the three motives, even if this were only for analytical purposes.*

(ii) The non-diversified portfolio result of the speculative motive.

(iii) The stipulation of long term bonds as the only alternative to holding money.

Baumol[6] and Tobin[7] tried to integrate the money demand function by establishing a link between the rate of interest and the transactions demand for money. Tobin has also contributed to an understanding of money demand by using the theory of risk avoiding behaviour to provide a basis for liquidity preference. "This theory does not depend on inelasticity of expectations of future interest rate, but can proceed from the assumption that the expected value of capital gain or loss from holding interest bearing asset is always zero."[8]

Modern quantity theorists put less emphasis on motives and concentrate more on the determinants affecting money demand. The demand for money is treated in the same way as the demand for a durable good. It is argued that just as durable goods provide a flow of services from which wealth-holders derive utility, so too money provides utility to the holder. Friedman[9] felt that the demand for money (like the demand for any asset) was dependent on three main factors: (1) the wealth constraint (defined to include both human and non-human wealth); (2) the yield on money in relation to the yield on other assets and (3) asset holder's taste and preferences. Even though he felt that the wealth variable was the appropriate budget constraint, difficulties of measurement led him to use the concept of permanent income (computed as an exponentially weighted average of current and past levels of income.

In both Keynesian and monetarist theories, the demand for money is viewed in terms of the demand for real balances.[10] Despite the positions taken by the two schools outlined above, it is often contended that the differences between Keynesians and Monetarists are more empirical than theoretical. Keynesians tend to take the position that the income elasticity of the demand for money will be above one, while the monetarists assume unitary elasticity. The extreme Keynesian version (reflected in the liquidity trap) was assumed to be minus infinity. With respect to interest rates, Keynesians generally assume a higher interest elasticity (around -1.0) than monetarists (around -0.1). In other words, Keynesians assume greater substitutability between money and financial assets.

Recent Trends in the Stock of Money in Trinidad & Tobago

Between 1970 and 1980 the narrow money supply, M_1 (currency in active circulation plus ajdusted demand deposits) grew at an average annual rate of 27.3% in nominal terms. (See Table 1). In 1981 it declined by 8.2%, but increased in 1972 and 1983 by 31.5% and 12.3% respectively. In 1984 it declined again by 5.9%. Between 1980 and 1973 the ratio of the currency component in M1 averaged around 35%, but apparently declined in the following years, averaging about 27% between 1974 and 1980. Since 1981 the ratio started to increase again and in the period between 1981 and 1984, it averaged about 33%. During the 1970's and early 1980's, it would appear that the factors leading to a downward effect on the currency ratio have tended to outweigh the factors having the opposite effect. Included in the former category would be the growth in the use of credit cards, an increasing tendency to use chequeing accounts and the offer of higher interest rates by financial institutions. There have also, as indicated before, been influences which may have served to increase the currency ratio. In the U.S. the increase in this ratio in recent years is suspected to be directly related to the growth of the underground

TABLE 1

Money Supply[1] Data, Income Velocity and the Inflation Rate, 1970-84

Year	(1) Currency in Active Circulation $ mn	(2) Demand Deposits (Adj) $ mn	(3) Narrow Money Supply M_1 $ mn	(4) % Change over previous Year	(5) (1) as a % of (3)	(6) Broad Money Supply M_2 $ mn	(7) % Change over previous Year	(8) (1) as a % of (6)	(9) M_1 Velocity	(10) M_2 Velocity	(11 Inflation Rate %
1970	54.1	97.3	151.4	12.7	35.7	472.8	21.6	11.4	10.8	3.4	3.3
1971	63.0	114.6	177.6	17.3	35.5	574.1	21.4	11.0	10.1	3.1	4.2
1972	76.3	140.0	216.3	21.8	35.3	704.9	22.8	10.8	9.4	2.9	6.1
1973	81.6	158.9	240.5	11.2	33.9	831.8	18.0	9.8	10.7	3.1	16.4
1974	88.9	198.3	287.2	19.4	30.9	1,014.3	21.9	8.8	14.6	4.1	23.9
1975	117.0	300.3	417.3	45.3	28.0	1,359.7	34.0	8.6	12.9	4.0	19.2
1976	158.3	463.6	621.9	49.0	25.5	1,833.7	34.9	8.6	10.0	3.4	8.1
1977	202.4	588.1	791.0	27.2	25.6	2,294.6	25.1	8.8	9.6	3.5	11.8
1978	268.4	803.2	1,071.6	35.5	25.0	2,960.9	29.0	9.1	7.6	2.8	10.2
1979	353.2	998.6	1,351.8	26.1	26.1	3,765.6	27.2	9.4	8.0	3.5	14.7
1980	431.7	1,254.6	1,686.3	24.7	25.6	4,574.7	21.5	9.4	9.4	3.5	17.5
1981	492.6	1,055.2	1,547.8	-8.2	31.8	4,988.9	9.0	9.9	11.6	3.6	14.4
1982	636.2	1,398.9	2,035.1	31.5	31.3	6,582.5	31.9	9.7	9.5	2.9	11.4
1983	764.5	1,520.6	2,285.1	12.3	33.4	7,374.1	12.0	10.4	8.4	2.6	16.7
1984	743.9	1,405.5	2,149.4	-5.9	34.6	7,944.3	7.7	9.4	9.4	2.5	13.3

1. The annual figures represent an average of end of quarter balances.

SOURCES: Central Bank, Monthly Statistical Digest, Various Issues; Ministry of Finance, Annual Review of the Economy, Various Issues, CSO, Annual Statistical Digest, Various Issues.

economy. In order to escape the tax authorities there is a tendency to conduct transactions on a cash basis. In Trinidad and Tobago where a substantial subterranean economy is believed to exist, one would have expected an upward effect on the currency ratio. This tendency should have been re-inforced by the higher effective tax rates resulting from the relatively high rates of inflation in recent years. The fact that tax collection has been lax has no doubt been a mitigating influence, and the increase in currency holdings has, therefore, been smaller than otherwise might have been the case.

The growth of broad money (M1 + adjusted bank savings and time deposits) has followed roughly the pattern of M1. Between 1970 and 1980, M2 experienced an annual growth rate of 25.5% in nominal terms. In 1981 this rate fell to 9%, but increased by 32% in 1982 and then fell to 12 and 7.7% in 1983 and 1984 respectively. Currency in circulation as a proportion of broad money also seems to have fallen in the period between 1974 and 1980.

With respect to the income velocity of money, the M1 version fluctuated between 7 and 15 between 1970 and 1984. On the other hand, the range of fluctuation for the M2 version was much smaller, the limits being 2.5 and 4.1. In the case of the latter, the trend seems to be a declining one since 1981. From the evidence it would appear that M2 velocity tends to be more stable than the M1 version.

Econometric Issues

An early difficulty encountered by the researcher in the specification of a money demand function is the so-called identification problem. Since the demand for money is an unobservable concept, in practice, researchers tend to use the supply of money as a proxy. If supply is taken to be equal to demand, this is equivalent to saying that the money market is always in equilibrium. This methodology is likely to be more valid for the narrow money supply which tends to be demand determined rather than the broader definition. It can be plausibly argued that the existence of monetary equilibrium does not guarantee the identification of the money demand function.

Another problem in specification revolves around the form of the function and the variables to be included in the function. A typical demand for money function often takes the form of Equation (1).

Eq. (1) $M_{dt} = by_t + cIR$

where

M_{dt} = demand for money in the current period

Y_t = the level of nominal income in the current period

IR = the rate of interest in the current period.

Other variables such as the price level is sometimes added. In most studies rather than include the price level as an explicit variable, the demand function is specified in real terms, such as Equation (2)

Eq. (2) $\frac{M_{dt}}{P} = a + b\frac{Y}{P} + cIR$

where 'P' is the price level and other letters carry the same meaning as before. $\frac{M_{dt}}{P}$ is referred to as real cash balances, and define the purchasing value of a given stock of money. The rate of interest 'IR' is measured in nominal terms and, therefore, incorporates inflationary expectations. In this approach the implicit assumption is that the price elasticity of the demand for money is unity. Some of the empirical studies do not bother to test this assumption, but rather accept it on the basis of the results obtained,i.e. if one finds a stable demand function ofor real money, this is taken as "an indication that the price level does not influence this demand for real balances and that the elasticity of the demand for nominal balances is indeed one."[11] Since in practice the price elasticity of the demand for money may not be unity, some approaches include the price level as an explicit independent variable.[12]

In Equation (1) the level of income and the rate of interest are assumed to be exogenous. This assumption is necessary in order to meet the requirements of conventional estimation methods. Equation (1) also assumes that the adjustment of money holdings to their equilibrium level occurs within the time period used in the study. If it is a quarter, adjustments take place within the quarter. If it is a year adjustments take place within a year.

In order to allow for lags in the adjustment process, a two equation model is sometimes used[13] as in equations (3) and (4) :

Eq. (3) $M^{*}_{dt} = a+bY_t + cIR_t$

where M^{*} is the desired stock of money

Eq. (4) $M_{dt} - M_{dt-1} = K(M^{*}_{dt} - M_{dt-1})$

with $0 < K < 1$

Equation (3) assumes that only a proportion (K) of the discrepancy between desired money holdings (M^{*}_{dt}) and actual money holdings in the previous time period is eliminated during the observation period. This partial adjustment model with 'K' as the speed of adjustment enables the derivation of a single equation by substituting Equation (2) in Equation (3).

Eq. (5) $M_{dt} - M_{dt-1} = K[a+bY_t+cIR_t-M_{dt-1}]$

Eq. (6) $M_{dt} = Ka+KbY_t+KcIR_t + (1-K)M_{dt-1}$

The functional forms used above are largely additive in nature. In practice the multiplicative form is more common since this enables the elasticity of the money demany with respect to particular independent variables to be obtained. In multiplicative form Equation (1) becomes

Eq. (7) $M_{dt} = a.Y_t^b.IR_t^c$

which is linear in logarithms and can be written as

Eq. (8) $\text{Log } M_{dt} = a+b. \log Y_t + c \log IR_t$

where 'b' and 'c' are elasticities.

The partial adjustment model can also be transformed into logarithmic forms:

Eq. (9) $\log M_{dt} = ka+kb \log Y_t + k \log IR_t + (1-k) \log M_{dt-1}.$

The coefficients 'b' and 'c' are the short run or impact elasticities. Due to the lagged dependent avariable (M_{dt-1}) the long run elasticities are kb/1-k and kc/1-k respectively.

In empirical work there is a great deal of controversy surrounding the variables to be used in the money demand function. Generally, as indicated earlier, the two most important variables are a scale variable which gives some indication of the volume of transactions in the economy and an opportunity cost variable measuring the return (expected or actual) on holding money relative to alternative assets, real or financial. Income is expected to be positively related to the demand for money, while the opportunity cost variable/is expected to be negatively related. With respect to the income constraint there is some dispute whether the concept used should relate to measured or absolute income or non-human wealth. Wealth itself is a difficult concept to measure and data are not easily available. While some studies use current income, others employ the permanent income concept which is a function of current and past actual income levels. Permanent income itself is not directly observable and tends to be calculated as a weighted average of current and past levels of income. As far as the opportunity cost variable is concerned, there are a number of alternatives. Some studies use various short term rates (such as savings deposit rates, three months-fixed deposit rate, bank discount rate) which assumes a close substitutability between money and other short term financial assets.[14] Others use a long term rate. Keynes himself thought the long term rate was the more appropriate. As far as the money stock is concerned studies have been carried out using both narrow and broad definitions. The narrow definition comprising demand deposits and currency in circulation is primarily a transaction demand. The broader definition takes account of the possibility that money might be demanded as an asset. It should be pointed out that while it is recognized that the motives for holding money may differ between firms and households, in the literature the specifications tend to be of an aggregate nature. This is often dictated by the unavailability of certain types of data.

III. Data and Results

In this section we use a series of linear models to examine the relationship between the demand for money in Trinidad and Tobago and certain selected variables. We experimented with both the narrow and broad money supply, and with various interest rates.

The Variables

M1 = narrow money supply (demand) - currency in active circulation plus demand deposits (adjusted)

M2 = M1 + bank savings and time deposits (adjusted)

Y2 = Permanent Income (a 3-year moving average of nominal GDP)

IR_1 = interest rate on savings deposits

IR_2 = interest rate on 3-months fixed deposits

IR_3 = average yield on 1-20 year government bonds.

IR_4 = weighted average rates on deposits

P = the price level (Retail Price Index)

EF = expected rate of inflation (the rate of change of the price level in the previous year)

Data and Model

The data used relate to the period 1970-84. The exercise has been carried out using annual data. GDP is not available on a quarterly or monthly basis. M1 and M2 have been annualised by taking an average of end of quarter balances. Where we have used 'real' data, these are simply the nominal figures deflated by the retail price index. The interest rates figures are the commercial bank rates ruling at the end of the period.

The basic model estimated is of the form shown in Equation (10).

Eq. (10) $M = a+bY+cIR+u$

where 'u' is an error term.

Method

- Ordinary Least Squares

Symbols

SEE = standard error of estimates (in parentheses below each coefficient)

D.W. = Durbin-Watson Statistic

(-1) = lagged one year

$\bar{R}^2$ = coefficient of determination (adjusted).

Empirical Results

In Table (2), we present the results based on nominal M1 as the dependent variable. Equations (11) to (17) are based on aggregate data, while Equations (18) to (22) use money demand and GDP in per capita terms. In all the equations in Table 2, the current income variable is significant. Income alone explains 96% of the variation in the demand for M1 (Equation 11). When the price level is added as a second independent variable (Equation 12), the $\bar{R}^2$ remains the same, but the D.W. statistic improves slightly. The price level variable has the desired sign, but the associated coefficient is not significant. When the interest rate on savings deposits is added as a third explanatory variable (Equation 13) the $\bar{R}^2$ remains un-affected and the D.W. statistic continues to indicate a serial correlation problem. The coefficient of the IR_1 variable has the expected sign, but is not significant. In Equation (14) we use the interest rate on 3-months fixed deposits (IR_2) in place of the savings deposits rate (IR_1), but this added nothing to the equation. In fact the sign is 'wrong'. In Equation (15) we experimented with a long term interest rate using the average yield on 1-20 year government bonds. The coefficient has the expected sign, but is not significant. The same statement can be made with respect to the weighted interest rate on deposits (IR_4) used in Equation (16). In Equation (17) we experimented with two interest rates: a short rate (the rate on three-months fixed deposits) and a long rate (the average yield on 1-20 year government bonds). Both interest rate variables are insignificant. The coefficient of the shorter rate also has the wrong sign. As indicated earlier, there is considerable controversy in the literature with respect to the interest rate variable used, i.e. whether it should be a short-term rate of a long term rate. This, of course, stems directly from the issue of substitutability between various financial assets and the money. The Equations (18 to 22) based on M1 and GDP expressed in per capita terms are similar in characteristics

TABLE 2

Results Using Aggregate Nominal M_1

Equation Number	Intercept	Y_1	P	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Value	D.W. Statistic
11.	- 30.75	0.11 (0.01)						0.96	345	1.6
12.	-147.75	0.07 (0.02)	1.70 (1.14)					0.96	190	1.9
13.	- 79.66	0.07 (0.03)	1.66 (1.20)	-16.10 (94.71)				0.96	116	1.6
14.	-183.93	0.07 (0.03)	1.74 (1.21)		6.69 (30.41)			0.96	117	1.7
15.	367.47	0.07 (0.03)	1.78 (1.24)			- 70.54) (243.24)		0.96	117	1.7
16.	25.85	0.08 (0.03)	1.69 (1.17)				-41.72 (63.21)	0.96	121	1.6
17.	530.97	0.07 (0.03)	1.88 (1.31)		11.24 (34.06	-101.30 (266.58)		0.96	81	1.7
	Results based on M_1 and GDP in Per Capita Terms									
18.	-30.63	0.11 (0.01)						0.96	308	1.5
19.	-104.66	0.08 (0.03)	1.27 (0.92)					0.96	166	1.6
20.	468.69	0.08 (0.03)	1.39 (1.00)			-78.93 (207.71)		0.96	103	1.6
21.	58.66	0.08 (0.02)	1.31 (0.94)				-40.46 (54.68)	0.96	107	1.6
22.	610.83	0.08 (0.03)	1.46 (1.07)		9.21 (29.71)	-105.06 (232.00)		0.96	71	1.6

to the aggregate equation. The $\bar{R}^2$ is around 0.96, but there is evidence of serial correlation in the error term. The coefficients of the income variable are significant, but the interest variables are either insignificant or have the 'wrong' sign, or both. The price level variable continues to show the expected sign, but the associated SEE are a bit on the high side.

Table 3, gives the results when all variables, dependent and independent are used in logarithmic form. Equations (23 to 29) are based on aggregate data, while Equations (30 to 34) were estimated with M1 and GDP in per capita terms. As indicated earlier, the coefficients of explanatory variables reflect their elasticities with respect to M1. In all the equations in this Table, the $\bar{R}^2$ is over 96%, but there appears to be a serious serial correlation problem in the error term. In Equations (23 to 29) the income elasticity of the demand for money is seen to vary between 0.67 and 1.10 depending on the particular specification. In Equations (23 and 24) which do not have the price level as an explanatory variable, the income elasticity is greater than one. In the per capita equations without the price level variable, the income variable also has an elasticity greater than one. The evidence from this Table indicates that the price level elasticity (with respect to M1) tends to be less than one. The savings deposit rate in Equation (26) has an elasticity of 0.04 with the expected sign, but the SEE is rather high. The weighted deposit rate used in Equation (24) has an elasticity of -0.29, but here, too, the value of the SEE is equivalent to the value of the coefficient. The three-months deposit rate used in Equation (27) has an elasticity of -2.15, but is below acceptable levels as far as significance is concerned. The long term rate is associated with an elasticity of -0.4 but here too the standard error raises some doubt about its significance. In Equation (29) where we use both a short rate (IR_2) and a long rate (IR_3) the former came out with the wrong sign. The latter had the expected sign, but was not significant. As far as the per capita equations are concerned, the results are not vastly dissimilar from the aggregate

TABLE 3

Results Using Nominal M1 with All Variables in Log. Form

Equation Number	Intercept	Y_1	P	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Value	D.W. Statistic
23.	-1.24	1.06 (0.05)						0.97	477	1.2
24.	-1.19	1.10 (0.06)					-0.29 (0.29)	0.98	234	1.0
25.	-2.80	0.80 (0.30	0.42 (0.48)					0.97	235	1.1
26.	-2.79	0.79 (0.31)	0.44 (0.51)					0.97	144	1.0
27.	0.55	0.68 (0.30	0.81 (0.55)		-2.15 (1.67)			0.97	166	1.0
28.	-2.64	0.73 (0.30)	0.62 (0.48)			-0.40 (0.29)		0.97	169	0.9
29.	1.16	0.67 (0.32)	0.84 (6.58)		0.09 (0.21)	-2.56 (1.97)		0.97	115	1.1
	Results based on Per Capita M1 and Per Capita GDP with all variables in Log. Form									
30.	-1.21	1.11 (0.07)					-0.28 (0.29)	0.97	209	1.0
31.	-2.69	0.77 (0.30)	0.43 (0.44)					0.97	209	1.1
32.	0.77	0.66 (0.31)	0.82 (0.52)			-2.18 (1.65)		0.97	149	1.0
33.	-2.49	0.70 (0.30)	0.64 (0.45)				0.41 (0.29)	0.97	151	0.9
34.	1.34	0.65 (0.32)	0.85 (0.54)	0.04 (0.10)	-2.57 (1.95)			0.97	103	1.1

equations. The interest rate variable continues to perform badly as far as significance is concerned. It should be noted that when we drop the opportunity cost variable (Equations 25 and 31), there is little effect on the equations.

In Table 4 we present the results when M1 and GDP are used in real terms. Here, there is a significant drop in the value of the $\bar{R}^2$ as compared to that in the previous two Tables. In the aggregate equations (35 to 39) it is 83%. When Equation (35) is compared to Equations (36 to 39), it is clear that the inclusion of an opportunity cost variable adds nothing to the explanatory power of the equations. Nor does it help in correcting the serial correlation problem associated with Equation (35). In none of the equations in this Table is the interest rate variable significant. It is worth noting that in the per capita Equations (40 to 43) the value of the $\bar{R}^2$ drops even further while the serial correlation problem persists.

In Table 5 we see the results when the variables of the equations containing real M1 and real GDP are converted into logarithms. In these equations, there is a small increase in the value of the $\bar{R}^2$ compared to those associated with the equations in Table 3, but the serial correlation problem continues to be serious. The income elasticity in both the aggregate and per capita equations is a little above one. The interest rate variable has elasticities of 0.15 and 0.16 (with the correct signs) in Equations (45) and (46) respectively, but the SEE in both cases is high. As was the case in the earlier equations, the interest rate variable does not seem to have any significant effect in the equations where they are used.

In Tables 6, 7, 8 and 9 experiments were carried out with broad money (M2) as the dependent variable. In Equation (53), income alone explains 96% of the variation in M2, but the D.W. statistic points to a possible specification problem.

TABLE 4

Results using Real MI

Equation Number	Intercept	Y	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Value	D.W. Statistic
35.	- 31.81	0.11 (0.01)					0.83	64	1.2
36.	- 40.54	0.11 (0.02)		2.36 (10.16)			0.83	30	1.2
37.	- 6.54	0.12 (0.02)				-7.78 (18.11)	0.83	30	1.2
38.	-109.55	0.11 (0.02)			11.45 (45.57)		0.83	30	1.2
39.	- 93.66	0.11 (0.02)		1.49 (12.02)	8.30 (53.95)		0.83	18	1.2
	Results based on Per Capita MI and Per Capita GDP								
40.	-29.89	0.11 (0.20)					0.78	47	1.2
41.	- 14.38	0.12 (0.02)				-4.98 (15.46)	0.78	22	1.1
42.	-119.02	0.11 (0.02)			13.33 (36.93)		0.78	22	11
43.	-102.72	0.11 (0.03)		1.49 (10.68)	10.11 (44.91)		0.78		1.2

TABLE 5

Results Using Real MI with All Variables in Log. Form

Equation Number	Intercept	Y	IR_1	$\hat{IR}_2$	$\hat{IR}_3$	$\hat{IR}_4$	$\bar{R}^2$	F Value	D.W. Statistic
44.	-1.43	1.12 (0.13)					0.85	76	1.1
45.	-1.23	1.09 (0.17)	-0.15 (0.48)				0.85	35	1.1
46.	-1.50	1.18 (0.16)				-0.16 (0.28)	0.86	36	1.0
47.	-1.49	1.11 (0.21)			0.12 (1.16)		0.85	35	1.1
48.	-1.44	1.11 (0.22)		0.02 (0.21)	0.06 (1.42)		0.85	21	1.2
			Results based on Per Capita MI and Per Capita GDP						
49.	-1.43	1.13 (0.15)					0.81	54	1.1
50.	-1.49	1.17 (0.19)			-0.11 (0.27)		0.81	25	1.0
51.	-1.55	1.08 (0.23)			0.31 (1.08)		0.81	25	1.1
52.	-1.52	1.08 (0.24)		0.02 (0.21)	0.26 (1.35)		0.81	15	1.1

TABLE 6

Results Using Nominal M2

Equation Number	Intercept	Y_1	P	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Value	D.W. Statistic
53.	- 253.82	0.36 (0.02)						0.96	287	0.8
54.	-1175.79	0.08 (0.05)	1.34 (0.23)					0.99	541	1.5
55.	-1953.21	0.07 (0.05)	13.81 (2.29)	184.30 (184.30)				0.99	361	1.8
56.	-1393.10	0.06 (0.05)	13.64 (2.34)		40.00 (59.70)			0.99	344	1.6
57.	-1625.75	0.07 (0.05)	13.33 (2.42)			61·63 (474·08)		0.99	331	1.5
58.	- 301.32	0.36 (0.04)					11.47 (242.67)	0.96	132	0.9
59.	-1256.87	0.07 (0.05)	13.40 (2.35)				19.50 (130.00)	0.99	332	1.5
60.	-1008.49	0.07 (0.06)	13.72 (2.56)		42.45 (67.38)	-54.50 (545.00)			235	
Results based on Per Capita M2 and Per Capita GDP										
61.	- 222.41	0.36 (0.02)						0.95	264	0.9
62.	- 843.33	0.08 (0.05)	10.71 (1.71)					0.99	538	1.6
63.	- 928.54	0.08 (0.05)	10.70 (1.87)			25.03 (391.00)		0.99	329	1.6
64.	- 324.75	0.35 (0.04)					25.03 (202.50)	0.95	122	0.9
65.	- 819.76	0.08 (0.05)	10.71 (1.79)				- 5.84 (97.33)	0.99	329	1.6
66.	- 423.38	0.07 (0.05)	10.96 (1.97)		32.74 (54.57)	-81.16 (427.16)		0.99	232	1.8

When the price level variable is included as an explicit variable (Equation 54) the $\bar{R}^2$ increases to 99% and the D.W. stastistic also improves. The price level variable is significant in all the equations in Table 6. In most cases the interest rate variable come out with the 'wrong' sign, and in all cases the SEE raise serious doubts about their significance.

Table 7 shows the results when the nominal figures are transformed into logarithmic form. Generally, the value of the $\bar{R}^2$ tends to be quite high in these equations, but the value of the D.W. statistic indicates problems in the error term. In both the aggregate and per capita equations the income elasticity with respect to M2 varies widely. In the former case, the range is 0.32 and 1.05, while in the latter's, it is 0.30 and 1.02. It would appear here that the inclusion of additional explanatory variables to income tend to have a downward effect on the income elasticity of M2. The price level variable has the expected sign and is significant in all the equations in Table 7. In Equation (69), where income, the price level and the interest rate on savings deposits are used as explanatory variables, the interest rate is associated with an elasticity of 0.11 with the expected sign, but the standard error is high. We have the same problem with the long term rate used in Equation (72), though in this case the elasticity is higher (-1.58). The three-months fixed deposit rate used in Equation (70) has the wrong sign. When both a short rate (IR_2) and a long rate (IR_3) are used (Equation 75), the three-months fixed deposit rate continues to show the 'wrong' sign, while the elasticity of the long term rate increases, maintaining the expected sign in the process. The interest rate variable in the per capita equations tend to display the same kind of characteristics as in the aggregate equations.

TABLE 7

Results Using Nominal M_2 with All Variables in Log. Form

Equation Number	Intercept	Y_1	P	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Statistic	D.W. Statistic
67	-0.68	1.05 (0.04)						0.98	635	1.0
68.	-1.46	0.42 (0.19)	1.00 (0.30)					0.99	587	1.2
69.	-1.32	0.40 (0.21)	1.02 (0.33)	-0.11 (0.31)				0.99	350	1.2
70	-1.46	0.42 (0.20)	1.00 (0.32)		0.002 (0.09)			0.99	346	1.2
71.										
72.	1.00	0.33 (0.19)	1.29 (0.34)			-1.58 (1.04)		0.99	420	1.2
73.	-0.68	1.05 (0.06)					0.03 (0.26)	0.98	293	1.0
74.	-1.36	0.38 (0.19)	1.12 (0.31)				-0.24 (0.19)	0.99	396	1.1
75.	1.73	0.32 (0.19)	1.33 (0.35)		0.10 (0.12)	-2.07 (1.20)		0.99	308	1.4
Results based on Per Capita M_2 and Per Capita GDP with All Variables in Log. Form										
76.	-0.57	1.02 (0.13)						0.82	59	0.9
77.	-1.18	0.39 (0.19)	0.97 (0.28)					0.99	525	1.2
78.	1.36	0.31 (0.19)	1.26 (0.32)			-1.60 (0.99)		0.99	397	1.2
79.	-1.06	0.35 (0.19)	1.10 (0.29				0.24 (0.18)	0.99	373	1.1
80	2.01	0.30 (0.19)	1.29 (0.32)		0.01 (0.01)	-2.05 (1.16)		0.99	288	1.4

Table 8 shows the results when M2 and GDP are used in real terms. In these equations the $\bar{R}^2$ tends to be lower than in the equations where the nominal figures are used. The serial correlation problem apparent from the value of the D.W. statistic raises doubts about the specifications both in the aggregate and per capita forms. The income coefficients continue to be significant (with the right sign) but all the interest rate variables have come up with the 'wrong' signs and large SEE.

In Table 9 we present the results of the experiments based on the logarithm of the equations containing M2 and GDP in real terms. In Equation (90) the income variable alone explains 87% of the variation in M2. The addition of the three-months fixed deposit rate (Equation 91) adds nothing to the equation (Equation 91). In fact, the value of the D.W. statistic falls. The addition of the long term rate (IR_3) in Equation (90) improves both the $\bar{R}^2$ and the D.W. statistic. While the coefficient in this equation is significant, however, it does not have the expected sing. The sign remains unchanged, even when we add a short term rate (IR_2) as an explanatory variable (Equation 94). The $\bar{R}^2$ associated with the per capita equations appear to be lower than those of the aggregate equations. Overall, the former does not seem to offer an improved fit. With respect to the income elasticity the figure varies between 1.04 and 2.14 in the aggregate equations, while in the per capita equation the range was 0.81 and 1.02. The various interest rates are associated with different elasticities. With the exception of the long term rate used in Equations (92) and (94), the standard errors are generally too large to take the values seriously. The sign in most cases is not what we would expect.

TABLE 8

Results Using Real M_2 and Real GDP

Equation Number	Intercept	Y	IR₁	IR_2	IR_3	IR_4	$\bar{R}^2$	F Statistic	D.W. Statistic
81.	- 25.42	0.33 (0.04)					0.83	64	0.9
82.	- 122.83	0.30 (0.05)		26.35 (28.48)			0.84	32	1.1
83.	--184.28	0.30 (0.05)				48.93 (50.93)	0.84	32	1.1
84.	-1701.34	0.23 (0.06)			246.89 (111.52)		0.88	44	1.3
85.	-1695.74	0.23 (0.06)		0.52 (29.42)	245.78 (132.09)		0.88	27	1.3
Results based on Per Capita M^2 and Per Capita GDP									
86.	5.06	0.32 (0.05)					0.78	46	0.9
87.	- 132.86	0.28 (0.06)				44.33 (41.75)	0.80	24	1.1
88.	-1331.82	0.22 (0.06)			200.00 (87.02)		0.85	33	1.3
89.	-1316.84	0.22 (0.06)		1.37 (25.19)	197.04 (105.89		0.84	20	1.3

TABLE 9

Results Using Real M_2 and Real GDP with All Variables in Log Form.

Equation Number	Intercept	Y	IR_1	IR_2	IR_3	IR_4	$\bar{R}^2$	F Statistic	D.W. Statistic
90.	-0.66	1.04 (0.11)					0.87	87	1.0
91.	-2.73	2.14 (0.28)		0.34 (0.32)			0.87	41	0.8
92.	-5.03	1.54 (0.31)			5.12 (1.72)		0.92	69	1.2
93.	-2.59	2.03 (0.30)				0.71 (0.51)	0.88	44	0.9
94.	-5.20	1.53 (0.33)		0.09 (0.31)	5.42 (2.10)		0.92	42	1.2
				Results based on Real Per Capita M^2 and Real Per Capita GDP					
95.	-0.57	1.02 (0.13)					0.82	59	0.9
96.	-0.49	0.97 (0.16)				0.15 (0.23)	0.83	28	1.1
97.	-1.08	0.81 (0.18)			1.36 (0.85)		0.85	34	1.2
98.	-1.05	0.81 (0.19)		0.01 (0.17)	1.31 (1.06)		0.85	21	1.2

Re-specified Equations

Given the unsatisfactory nature of the fit of most of the equations in Tables 2 to 9, we decided to experiment with some new specifications. The results are presented in Tables 10 and 11. In Table 10 the dependent variable is M1, while in Table 2, it is M2. All the equations in these Tables were estimated with the variables in logarithmic form. The coefficients can, therefore, be regarded as elasticities. Given the unsatisfactory performance of the interest rate variables we decided to retain only one of them - the weighted rate on deposits (IR_4). In Equation (100), the income, interest rate and price level variables together explain 98% of the variation in narrow money. The D.W. statistic, however, is unsatisfactory. In Equation (101), we dropped the price level variable and introduced the expected rate of inflation variable, which in this equation has a negative effect on the demand for money. The $\bar{R}^2$ did not change, but the D.W. statistic improved. In Equation (102) we introduced a fourth explanatory variable, viz., M1 lagged one year. These four variables explain 99% of the variable in M1. The D.W. statistic has an acceptable value. With the exception of the expected rate of inflation variable all the other coefficients are significant. They also have the expected signs. The income elasticity is 0.46 as compared to -0.48 for the interest rate, -0.05 for the expected inflation rate and 0.64 for lagged money demand. In Equation (103) we substituted the price level variable for the expected rate of inflation, and while the fit is good, the price level variable not only does not have expected sign, but is also insignificant. ¶In Equation (104) where we used both 'P' and 'ER' the fit is good, but 'P' continues to have the wrong sign with a high standard error. In Equation (105) we dropped the interest rate variable, and even though the overall fit is good, all the coefficients appear to be statistically insignificant.

TABLE 10

Re-Specified Log-Linear Models with M1 as the Dependent Variable.

Biased towards 2

Equation Number	Intercept	Y_1	IR_4	P	ER	$M1_{-1}$	$\frac{P}{P_{-1}}$	$\bar{R}^2$	F	D.W. Statistic
99	-1.19	1.10 (0.06)	-0.29 (0.29)					0.98	239	1.0
100	-1.14	0.73 (0.30)	-0.41 (0.29)	0.62 (0.48)				0.98	169	0.9
101	-1.26	1.17 (0.06)	-0.29 (0.25)		-0.19 (0.08)			0.98	216	1.3
102	-0.28	0.46 (0.19)	-0.48 (0.17)		-0.05 (0.07)	0.64 (0.16)		0.99	381	2.1
103	-0.12	0.43 (0.18)	-0.48 (0.17)	-0.18 (0.33)		0.75 (0.16)		0.99	373	2.3
104	1.23	0.69 (0.32)	-0.53 (0.18)	-0.09 (0.33)	-0.11 (0.11)	0.52 (0.27		0.99	298	2.3
105	-0.69	0.56 (0.41)		-0.37 (0.44)	-0.07 (0.13)	0.68 (0.35		0.99	212	1.9
					Real Money Balance $\left(\frac{M1}{P}\right)$ as the Dependent Variable					
		$\frac{Y_I}{P}$				$\left(\frac{M1}{P}\right)_{-1}$				
106	-1.32	0.74 (0.39)	-0.27 (0.35)			1.38 (0.32)		0.96	86	1.3
107	-1.81	0.98 (0.45)	-0.09 (0.37)			1.24 (0.35)	-1.36 (1.3)	0.96	65	1.2
108	-2.00	0.62 (0.29)	-0.49 (0.15)		-0.05 (0.07)	0.67 (0.17)		0.95	75	2.3
109	-2.07	0.64 (0.40)			-0.06 (0.11)	0.52 (0.22)		0.92	53	1.7
				Nominal M1 with Permanent Income (Y_2) as the Income Variable						
		Y_2				$M1_{-1}$				
110	-1.47	1.15 (0.06)	-0.11 (0.27)					0.98	265	1.1
111	-1.38	0.90 (0.36)	-0.22 (0.31)	0.40 (0.57)				0.98	170	0.9
112	-1.56	1.22 (0.06)	-0.11 (0.22)		-0.19 (0.08)			0.98	256	1.7
113	-0.46	0.52 (0.21)	-0.39 (0.18)		-0.06 (0.07)	0.60 (0.17)		0.98	388	2.2
114	-0.26	0.56 (0.22)	-0.36 (0.18)	-0.35 (0.36)		0.75 (0.15)		0.99	398	2.6
		$\frac{Y2}{P}$								
115	-2.07	1.00 (0.43)	-0.02 (0.35)			1.26 (0.31)		0.96	98	1.6
116	-2.86	1.35 (0.47)	0.19 (0.37)			-1.07 (0.33)	-1.69 (1.21)	0.97	87	1.8

In Equations (106) to (109) money demand and GDP are used in real terms. While the $\bar{R}^2$ in these equations is over 90%, it is below the values associated with the nominal equations. In Equation (107) we added a new variable (the ratio of the current price level to the price level in the previous year), but this variable was of no significarce in the particular specification which included income, the interest rate and lagged money as the other explanatory variables.

In Equations (110) to (116), instead of using current income we used a permanent income concept which we computed as a three year moving average of current income. Equation (113) appears to be the best of these equations in terms of fit. Permanent income, the interest rate variable and lagged money are all significant with what appears to be the correct sign. The coefficient of the expected rate of inflation has a negative sign, but the value of the SEE raises doubt about its significance.

The equations in Table 11 have M2 as the dependent variable. Since the equations were estimated using the logarithms of the variables, the coefficients, as indicated earlier, can be regarded as elasticities. An examination of Equations (117) to (123) clearly indicates that M2 lagged one period is a significant variable in the specification of broad money demand. As far as the elasticities are concerned, the income elasticity with respect to broad money tends to vary depending on the specification. For instance, in Equation (119) it is slightly over one, while in Equation (123), it is 0.23. The interest elasticity in these equations tend to be less than one. On the basis of the evidence provided by the Table, it is difficult to make any conclusive statement with respect to the price level elasticity. The coefficient of broad money lagged one period tends to be less than one in the nominal equations. The equations using broad money and GDP in real terms (Equations 124 to 127) are associated with high $\bar{R}^2$, but with the exception

TABLE 11

Re-Specified Log-linear Models with M2 as the Dependent Variable

Equation Number	Intercept	Y_1	IR_4	P	ER	$M2_{-1}$	$\frac{P}{P_{-1}}$	$\bar{R}^2$	F Statistic	D.W. Statistic
117	-0.68	1.05 (0.06)	-0.03 (0.26)					0.98	293	1.0
118	-0.59	0.38 (0.19)	-0.24 (0.19)	1.12 (0.31)				0.97	396	1.1
119	-0.73	1.10 (0.06)	-0.03 (0.23)		-0.14 (0.08)			0.98	232	1.1
120	-0.14	0.27 (0.10)	-0.21 (0.09)		-0.03 (0.03)	0.77 (0.09)		0.99	1377	2.5
121	0.03	0.23 (0.10)	-0.21 (0.09)	-0.02 (0.24)		0.81 (0.13)		0.99	1225	2.5
122	-0.18	0.30 (0.14)	-0.24 (0.10)	0.07 (0.29)	-0.33 (0.05)	0.71 (0.20)		0.99	762	2.6
123	0.11	0.23 (0.17)		-0.18 (0.32)	0.01 (0.04)	0.86 (0.23)		0.99	626	2.2
		$\frac{Y_1}{P}$				$\left(\frac{M2}{P}\right)_{-1}$				
124	-1.12	0.27 (0.31)	0.05 (0.28)			1.77 (0.28)		0.97	136	1.3
125	-1.50	0.45 (0.30)	0.05 (0.26)			1.69 (0.26)	-1.65 (0.88)	0.97	136	1.3
126	-0.23	0.26 (0.16)			0.002 (0.04)	0.75 (0.11)		0.98	186	2.1
127	-1.53	0.44 (0.30)	-0.03 (0.25)		-0.16 (0.09)	1.76 (0.25)		0.98	126	1.1

Nominal M_2 with Permanent Income (Y_2) as the Income Variable

Equation Number	Intercept	Y_2	IR_4	P	ER	$M2_{-1}$	$\frac{P}{P_{-1}}$	$\bar{R}^2$	F Statistic	D.W. Statistic
128	-0.95	1.10 (0.05)	0.13 (0.20)					0.98	456	1.2
129	-0.74	0.54 (0.22)	-0.12 (0.19)	0.89 (0.34)				0.99	451	1.0
130	-1.02	1.15 (0.04)	0.13 (0.17)		-0.15 (0.06)					
131	-0.21	0.40 (0.10)	-0.13 (0.08)		-0.05 (0.03)	0.66 (0.09)		0.99	1974	2.9
132	-0.08	0.33 (0.11)	-0.14 (0.09)	-0.12 (0.22)		0.78		0.99	451	1.0
		$\frac{Y_2}{P}$								
133	-1.43	0.42 (0.39)	0.05 (0.30)			1.68 (0.31)		0.97	140	1.3
134	-2.00	0.67 (0.36)	0.20 (0.27)			1.56 (0.28)	-1.76 (0.85)	0.98	138	1.3

of Equation (126), the D.W.statistic points to a problem in the error term. In the equations containing permanent income as an explanatory variable, the income coefficients continue to be significant, while the associated $\bar{R}^2$ remains high. The value of the D.W. statistic in Equations (128) to (132), however, raises some doubts about the specifications of these equations. In Equations (133) and (134) broad money demand, permanent income and lagged money are used in real terms. In these equations the SEE of income raises some doubts about the significance of this variable. The interest rate variable is un-acceptable in terms of sign and statistical tests. Lagged money appears to be significant, as does the price level ratio, though the sign in both cases is not the expected one.

Forecasting Capability of Equations

A commonly used criterion in assessing a model is its ability to predict. In this connection the standard error of estimate (or the root mean square error) tends to provide a good test for the particular equation. The smaller the residuals of a regression model, the smaller the forecasting errors are likely to be. On the basis of the $\bar{R}^2$ and the D.W. stastistic we selected what we considered to be the 'best' of the equations and compared their respective SEE. (See Table 12). Among the equations with M1 as the dependnet variable, Equation (104) has the lowest standard error. Among those with M2 as the dependent variable, Equation (122) stands out. It should be noted that the equations with real money balance as the dependent variable (108 and 126), the associated SEE tends to be high.

TABLE 12

Equations with M1 as the Dependent Variable

Equation No.	SEE
(104)	5.46
(102)	7.77
(103)	8.16
(105)	10.80
(108)	25.42

Equations with M2 as the Dependent Variables

Equation No.	SEE
(122)	4.32
(120)	4.34
(121)	4.42
(123)	5.46
(126)	13.90

Summary and Conclusions

The paper has examined a series of linear models with the aim of deriving specifications which could explain movements in the demand for both narrow and broad money in Trinidad and Tobago in recent years. From the experiments we have carried out, it would appear that there are several equations which meet the overall goodness of fit tests. With respect to individual variables, income (be it nominal, real or permanent) appear to be the most significant of the explanatory variables. The lagged-money variable also appears to be a crucial influence. We have used a number of interest rates variables, but none gives a satisfactory performance.[15] Even though the sign comes out 'right' in a number of cases, the standard error is generally too high for comfort. We have shown that it is possible to drop the interest rate variable without doing any damage to the equations. On the basis of the results obtained, however, it would be foolhardy to conclude that the interest rate variables is not important to the money demand specification. In most studies done on the demand for money in developed countries and even in some developing countries, the demand for money was shown to be sensitive to movements in interest rates. Our own suspicions are that the rates published by the Central Bank, which tend to show little movements over time, may not be the actual rates faced by the public in the market place. One series which might have provided better results, but on which we are unfortunately not able to gather the necessary data, are the rates offered by the non-bank financial institutions which have tended to be used more aggressively than those offered by the commercial banks. With respect to the price level variable and expected inflation rate variable, these can, and often do exert an influence on the demand for money. With respect to the assumption of unit price elasticity in the real money balance equation, there is some doubt about this.

As far as the issue of stability is concerned, it is difficult to make a conclusive statement on the basis of the limited exercise carried out. One approach in the literature is to look at the goodness of fit (standard errors, D.W. statistic , $\bar{R}^2$, etc.), and on the basis of this make a conclusion on stability. This conclusion is also often subject to an additional requirement , and that is the ability of the equation to predict outside the sample period. Recent experience has shown than an equation that might be a good predictor in a particular period may not do so well in another. The fact that the predictive ability of an equation is under challenge does not, of course, mean that the demand for money is unstable. It may simply mean msomething is wrong with the equation.

FOOTNOTES

1. For a survey of recent reformulations of the demand for money function, see, J.P. Judd and J.L. Scadding, "The Search for a Stable Money Demand Function: A Survey of the Post-1973 Literature," Journal of Economic Literature, Sept., 1982.

2. See R.W. Hafer and S.E. Hein, "The Shift in Money Demand: What Really Happened?" Federal Reserve Bank of St. Louis, Review, Feb., 1982.

3. See, for example, D.E.W. Laidler, The Demand for Money (London: Intertext Books, 1969).

4. H. Viser, The Quantity of Money (London: Martin Robertson & Co., 1974) p. 63.

5. J.M. Keynes, The General Theory of Employment, Interest and Money (London: Macmillan and Co., 1964). pp. 169-172.

6. W.J. Baumol, "The Transactions Demand for Cash: An Inventory Theoretic Approach,: Quarterly Journal of Economics, Nov., 1952.

7. J. Tobin, "The Interest Elasticity of Transactions Demand for Cash," Review of Economics and Statistics, August, 1956.

8. J. Tobin, "Liquidity Preference as a Behaviour towards Risk," The Review of Economic Studies, Feb., 1958.

9. See Milton Friedman, "The Quantity Theory of Money - A Restatement," in M. Friedman (ed.) Studies in the Quantity Theory of Money (Chicago: The University of Chicago Press, 1956).

10. The money demand equation is assumed to have the mathematical property of being homogeneous of degree one in prices.

11. Viser, op. cit. p. 63.

12. For an example where the price level variable is used as an explicit explanatory variable, see A.W.A. Mc Clean, "Some Evidence on the Demand for Money, in a Small Open Economy - Barbados," in SES, Sept., 1982.

13. See Graham Haache, "The Demand for Money in The United Kingdom: Experience since 1971," Bank of England Quarterly Bulletin, Sept., 1974.

14. In this connection one oresearcher has suggested that the yield on non-bank intermediary liabilities is the most significant interest rate variable in affecting the demand for money. See Tong Hun Lee, "Alternative Interest Rates and the Demand for Money: The Empirical Evidence," American Economic Review, Dec., 1967.

15. Cf. Compton Bourne, "Dynamic Utility - Maximising Models of the Demand for Money in Caribbean Economics (with an application to Jamaica)," SES, Sept., 1974.