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THE DEMAND FOR MONEY WITH REAL INTEREST RATES AFTER TAXES

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J.M. Keynes (1936) found the classical transaction approach to the demand for money lacking because it overlooked the possibility that people may elect to hold money as an asset instead of other liquid assets when prices of the latter are expected to fall. William Baumol (1952) studied the impact of the interest rate on the transactions demand for money. For decades, Post-Keynesians have explained the variations in the demand for real money balances on the basis of **nominal** interest rates and other **real** explanatory variables.[1]

M. Friedman (1956) was the first to suggest that the demand for real money balances is determined by real rather than nominal interest rates.

In this paper, the demand for real money balances is explained by the expected rate of inflation and by **real** variables, in particular real income and real rates of return on assets after taxes. Our model differs from Friedman's in four ways. First, interest rates are net of taxes. Second, two interest rates are considered to reflect people's portfolio choices rather than one single rate. Third, real income rather than wealth is entered as the constraint in the implicit optimization model. Fourth, an optimum stock adjustment mechanism is introduced.

This paper has several stimulating findings. First, identical increases in after-tax real yields on Treasury bills and common stock have virtually the same negative impact on the demand for money. This implies that, once economic agents have taken account of differences in risk premia among assets in choosing an optimum portfolio, they treat all financial assets as roughly equivalent substitutes for money in response to equal small changes in real after-tax rates of return. Second, the demand for money is interest inelastic. Although income inelastic in the short run, money demand is income elastic in the long run. This implies that there are no economies of scale in holding money and that money is a luxury good. Third, a rise in anticipated inflation lowers the demand for real cash balances as economic agents move out of money and into real goods. Finally, the Post-Keynesian demand for money model developed in this paper is stable and outperforms the neo-classical model in forecasts outside the sample period.

The paper is organized as follows. S. Goldfeld's model is discussed in secton I. Definitions, constructions, sources and mnemonics of variables are listed in section II. The theoretical model is presented in section III, while its empirical verification is analyzed in section IV and stability tests are performed in section V. Section VI establishes whether M1 or M2 should function as the money stock variable. The final section of the paper contains the main conclusions.

Goldfeld's Model

In his classic paper, "The Demand for Money Revisted," Stephen Goldfeld (1973) presented the following model:

$$\ln M1_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln M1_{t-1} + \beta_3 \ln RTD_t + \beta_4 \ln RCP_t + \beta_5 \ln (P/P)^{\varepsilon}_t,$$

where M1 is the narrow money stock, Y is real gross national product, RTD is the time deposits rate, RCP is the commercial paper rate, and $(P/P)^{\varepsilon}$ is the expected rate of inflation.

The estimated equations are as follows:

$$\ln M1_t = \underset{(5.6)}{.200} \ln Y_t + \underset{(11.3)}{.698} \ln M1_{t-1} - \underset{(3.6)}{.046} \ln RTD_t - \underset{(4.9)}{.016} \ln RCP_t - \underset{(1.9)}{.143} \ln (P/P)^{\varepsilon}_{t(1)}$$

$$\bar{R}^2 = .996;\ \varrho = .41$$

$$\ln M1_t = \underset{(5.6)}{.200} \ln Y_t + \underset{(11.1)}{.693} \ln M1_{t-1} - \underset{(4.0)}{.044} \ln RTD_t - \underset{(4.9)}{.016} \ln RCP_t - \underset{(1.8)}{.211} \ln (P/P)^{\varepsilon}_{t(2)}$$

$$\bar{R}^2 = .996;\ \varrho = .41$$

The model was estimated on the basis of quarterly data. $(P/P)^{\varepsilon}{}_{(1)}$ and $(P/P)^{\varepsilon}{}_{(2)}$ are two alternative series of the expected rate of inflation, as constructed by G. deMenil (1973). Three observations are noteworthy.

First, the interest rates are in nominal terms. A nominal interest rate consists of the real interest rate, the expected rate of inflation and a risk premium characteristic of that asset relative to a riskless asset. The nominal interest rate is thus highly correlated with the expected rate of inflation, leading to multicollinearity. This problem explains why expected inflation is not a statistically significant determinant at the 5% level of the demand for real money balances in Goldfeld's model. Accordingly, there are two reasons why the real, rather than the nominal interest rate, should be included as an explanatory variable in the demand for money: it reduces multicollinearity in demand for money models where the expected rate of inflation enters together with interest rates as explanatory variable and, in choosing the composition of their portfolio, economic agents consider the **real after-tax rate of return** on financial assets, rather than nominal interest rates.

Second, there is no constant term in the estimated equations, contrary to the theoretical model hypothesized.

Third, Goldfeld (1973) studies numerous specifications of the demand for money and tests the stability of only a subset of these specifications. No attempt was made to select a specific model as superior on the basis of its stability or its predictive power. The model presented in this paper will be tested for stability and its predictive power will be compared with that of other popular models of the demand for money in Section IV.

Definitions and Construction of the Variables of the Model

The crucial determinant of the real demand for money (M1) is real income, or a proxy, real gross national product (RGNP). Since the federal government's money balances are not included in M1, it was decided to remove federal government spending on goods and services from RGNP, leaving the **corrected** real gross [illegible]nal product (RGNPC) as the proxy for real income in this paper.

Both short-run T[illegible] bills and common stock are assets often held in portfolios in addition to money. Therefore, the real Treasury bill rate after taxes and corrected for inflation (RTB)[2] and the rate of after-tax real earnings on common stock (SPRC) were included as relative price variables in the demand for money.[3] Additional rates of return on financial assets were not introduced in the demand for money equation to avoid excessive multicollinearity.

The real after-tax Treasury bill rate is computed as follows. The nominal rate is corrected for taxes by multiplying it by one minus the tax rate. The expected rate of inflation is then deducted from the tax-corrected rate. The resulting after-tax real rate of return on an asset still includes a risk premium typical for that asset.

A rise in anticipated inflation (FCLD) calls for a ceteris paribus reduction in the demand for money and a rise in the demand for real goods (M. Friedman, 1956, and H. Johnson, 1972). Anticipated inflation is measured in this paper as the December unadjusted forecast of the expected rate of consumer price inflation twelve months ahead.[4]

M1 is the new money stock variable.[5] End-of-period data were used throughout. For RGNPC, the last quarter of the year was selected, while anticipated inflation pertains to the CPI forecasts made in December. To deflate the variables, the implicit GNP deflator was used.

The Model

The model in this paper is based on the work of Baumol (1952) and Goldfeld (1973). M1* is the desired level of money holdings and is a function of the variables discussed in section II.

$$(1)\ M1_t^* = RGNPC_t^{\alpha_1} \cdot RTB_t^{\alpha_2} \cdot FCLD_t^{\alpha_3} \cdot SPRC_t^{\alpha_4},$$

where $\alpha_1 > 0$; $\alpha_2 < 0$; $\alpha_3 < 0$; $\alpha_4 < 0$.

Actual money holdings are assumed to adjust each year to the gap between desired holdings and actual holdings observed during the previous period.[6] A stock adjustment mechanism expressed as a double-logarithmic equation is introduced.

$$(2)\ \ln M1_t - \ln M1_{t-1} = \lambda(\ln M1_t^* - \ln M1_{t-1}).$$

Taking logarithms of both sides of (1) and solving (1) and (2) for $\ln M1_t$ yields equation (3).

$$(3)\ \ln M1_t = \beta_0 + \beta_1 \ln RGNPC_t + \beta_2 \ln RTB_t + \beta_3 \ln FCLD_t + \beta_4 \ln SPRC_t + \beta_5 \ln M1_{t-1},$$

where $\beta_0 > 0$; $\beta_1 > 0$; $\beta_2 < 0$; $\beta_3 < 0$; $\beta_4 < 0$; $0 < \beta_5 < 1$.

The Estimated Model

The model is estimated on the basis of annual data covering the period 1966-1981 and the empirical results are shown in Table 1.[7] t-Statistics are listed in parentheses under the estimated coefficients.

Table 1
The Demand for Money and its Determinants

$\ln M1_{t-1}$	ln RGNPC	ln RTB	ln FCLD	ln SPRC	C
.75978	.30265	−.02777	−.10366	−.023687	−.64259
(7.86)	(6.44)	(−2.24)	(−7.46)	(−3.94)	(−1.02)
				$\bar{R}^2$ = .8663	
				D-W = 1.8572	
				SEE = .0099	

The statistical characteristics of the equation are very favorable. Eighty-seven percent of the variation in the real demand for money is explained (at a significance level of 1%) by changes in the explanatory variables. All estimated coefficients carry the sign indicated by economic theory and, with the exception of the constant term, are significantly different from zero at the 5% level.

Some estimates of the parameters will be compared with those of other models. The impact of the lagged dependent variable on the current money stock is 0.760 in this model. This compares closely to Goldfeld's 0.7 (1973). The average value of the estimate of the basic Goldfeld model — estimated with **annual** data — is 0.784. A test of the equality of the coefficient of the lagged dependent variable and the value of 0.784 fails to be rejected at the 5% level. The speed of adjustment (0.24) implied in this model is thus plausible.[8]

The estimate of income's parameter is 0.303, which is nearly double the average (0.158) of nine papers on the demand for money discussed by Judd and Scadding, although well below the 0.5 reported by Kimball (1980). Goldfeld (1973) found values of up to 0.242. A test of the equality of the estimated coefficient of the income variable (0.303) and the value 0.242 fails to be rejected at the 5 % level of significance. Although income inelastic in the short run, the demand for money in this paper exhibits a long-run income elasticity of 1.26. This implies that there are no economies of scale in holding money and that money is a luxury good.[9]

The choice between money and Treasury bills is reflected by a coefficient of −0.02777, where the Treasury bill rate is expressed in real terms and corrected for taxes. The choice between money and common stock is reflected in the size of the respective coefficient, equal to −0.023687 in this model. It is very interesting to see that the same increases in the tax-corrected real yields on Treasury bills and on common stock have nearly the same impact on the demand for money.

Goldfeld's study (1973) of the estimates of the coefficients for alternative nominal interest rate variables in the demand for money equation exhibits a range of −0.019 to −0.020 for the commercial paper rate, −0.012 to −0.014 for the Treasury bill rate, and −0.021 to −0.017 for the corporate bond yield. The expected rate of inflation is excluded from the model.

Goldfeld's estimates of the coefficients of the commercial paper rate and the corporate bond yield — albeit somewhat smaller — are comparable to those for the after-tax real rates shown in Table 1. Although his estimates would have heen somewhat higher if after-tax real rates had been used, they would also have been lowered somewhat by the introduction of anticipated inflation in the model. This implies that the estimates of the parameters of **after-tax real rates of return** on Treasury bills, common stock, commercial paper and corporate bonds in the demand for money will all be approximately equal in size.

However, Goldfeld's estimate of the parameter for the Treasury bill rate, ranging from −0.012 to −0.014, is considerably smaller than that shown in Table 1 of this paper. His estimate would have been rendered even smaller if expected inflation had been introduced in the model. Indeed, when anticipated inflation enters the demand for money (e.g., Goldfeld, 1973), the estimate of the parameter of the nominal commercial paper rate drops from −0.020 to −0.016. It is clear, therefore, that real after-tax rates of return to assets are the proper explanatory variables in the demand for money equation, especially if anticipated inflation is also an independent variable.

The long-run interest elasticity (based on the after-tax real Treasury bill rate) is −0.11. The results thus indicate that the demand for real money balances is interest inelastic in both the short and long run.[10]

Anticipated inflation is a key variable in the demand for money. The empirical results in Table 1 show that a rise in anticipated inflation leads to a fall in the demand for money as economic agents switch from money to real goods. The estimate of the parameter of expected inflation is statistically significant in **all** the equations estimated for different lengths of sample periods and for other stability tests, to be discussed in the following section.

Stability Tests

The model is estimated on the basis of new annual data for M1 for 1966-1981 and the sample size is thus small. Hence, various stability tests, requiring a fairly large sample size, have not been conducted.

The first test conducted consists of dropping observations at the end or adding observations at the beginning of the sample period. The model is then reestimated for each sample size. Four regressions have been obtained in this manner, and are presented in Table 2, parts a and b. The estimates of the **crucial** parameters of the model — indicated with an asterisk in the table — are remarkably stable. The stability of the interest responsiveness of the demand for money (coefficient of ln RTB) cannot be properly considered because three of the four estimates of the respective parameter are not statistically significant at the 5% level. However, parts a and b of Table 2 offer strong evidence that this demand for money is stable, especially vis-a-vis real income, expected inflation and the real average yield on common stock, corrected for taxes. The real Treasury bill rate corrected for taxes is only significant at 5% for the sample period 1966-1981.

Table 2
A Stability Test of the Estimates of the Coefficients When the Sample Size is Small

a. Estimated Equations for Different Sample Periods

Variables	1960-1978	1960-1981	1966-1981	1966-1978
ln $M1_{t-1}$	0.83424	0.93370	0.75978	0.72253
	(6.79)	(9.95)	(7.86)	(6.03)
*ln GNPC	0.28415	0.27737	0.30265	0.31533
	(5.51)	(5.79)	(6.44)	(5.54)
ln RTB	−0.023571	−0.02723	−0.2777*	−0.025021*
	(−0.99)	(−1.35)	(−2.24)	(−1.69)
*ln FCLD	−0.081452	−0.08831	−0.10366	−0.10228
	(−4.93)	(−5.99)	(−7.46)	(−5.94)
*ln SPRC	−0.024923	−0.023399	−0.023687	−0.02585
	(−2.83)	(−3.48)	(−3.94)	(−2.98)
C	−0.9404	−1.4376	−0.64259	−0.52741
	(−1.35)	(−2.53)	(−1.02)	(−0.70)
$\bar{R}^2$	0.9466	0.9428	0.8663	0.8376
D-W	1.7886	1.6906	1.8572	1.9977
SEE	0.012097	0.01168	0.009887	0.01033

b. Comparison of Coefficients of Crucial Explanatory Variables

	ln M_{t-1}	ln GNPC	ln RTB	ln FCLD	ln SPRC
Maximum	0.93	0.32	−0.028	−0.102	−0.026
Final Equation	0.75	0.30	−0.028	−0.104	−0.024
Minimum	0.72	0.28	−0.024	−0.081	−0.023

A second test of stability relates to changing the specification of the model by including additional variables which logically could be found in a money demand model. The test consists of observing whether the estimates of key parameters of the original model are markedly different in the modified model. First, unanticipated inflation and the variance of relative prices were introduced in the standard model. The range of basic parameter estimates is shown in Table 3. Estimates with an asterisk indicate a high degree of stability of the key parameters of the model.

Table 3
Range of Basic Parameters

	$\ln M1_{t-1}$	ln GNPC*	ln RTB	ln FCLD*	ln SPRC*
Maximum	0.858	0.319	−0.028	−0.104	−0.027
Basic Equation	0.759	0.303	−0.028	−0.104	−0.024
Minimum	0.718	0.282	−0.024	−0.079	−0.021

The third test assesses how well the model can forecast within and outside the sample period, by comparing its forecasts to those obtained from other models. The accuracy of the forecasts is measured by the root mean square error (RMSE), Theil's (1971) U coefficient and the maximum absolute error (MAE). The augmented model adds to the standard model the following two variables: unanticipated inflation and the variance of relative prices. Table 4 shows that the model with the lowest measures of the accuracy of the forecast, i.e. the standard model, predicts better in the sample period.

Table 4
Comparison of Forecast Accuracy Inside the Sample Period (1960-1978)

	Augmented Model	Standard Model
RMSE	0.00955	0.00758
U	0.455	0.318
MAE	0.00777	0.00669

Now, see how these two models perform **outside** the sample period (1979-1981). The performance indicators are listed in Table 5. The standard model outperforms the augmented model markedly in forecasting outside the sample period.

The second model developed for comparison to the standard model is Goldfeld's basic model, reestimated with annual data (M1). Only its forecast ac-

Table 5
Comparison of Forecast Accuracy Outside the Sample Period (1979-1981)

	Augmented Model	Standard Model
RMSE	0.01541	0.00837
U	0.803	0.471
MAE	0.01498	0.00745

curacy outside the sample period is compared with that of the standard model. The results are shown in Table 6. It is clear that the standard model outperforms Goldfeld's model in forecasting outside the sample period.

Table 6
Forecasts Outside the Sample Period (1979-1981)

	Goldfeld Model	Standard Model
RMSE	0.0098212	0.00837
U	0.603	0.471
MAE	0.0088961	0.00754

Many economists believe that the classical demand for real money balances is mainly related to real income. The standard model, presented in this paper, is a better forecasting tool of the demand for real money balances than the classical model. The results of this test are shown in Table 7. Accordingly, it can be said without doubt that the standard model of the demand for money exhibits strong stability.

Table 7
Forecasts Outside the Sample Period (1979-1981)

	Classical Model	Standard Model
RMSE	0.01545	0.00837
U	0.938	0.471
MAE	0.01156	0.00745

M1 or M2?

S. Goldfeld (1973) indicates that, if his basic model is estimated with M2 using quarterly data, unsatisfactory results are obtained. The standard model in this paper, estimated on the basis of M1, is superior to the version estimated with M2. It is clear from this that many models, placing a strong emphasis on transactions, benefit from focusing on M1 in the demand for money, even when several relative price variables reflecting portfolio choices are part of the same model.

Conclusions

It has been shown in this paper that the demand for real money balances is well explained by real explanatory variables, in particular the real after-tax Treasury bill rate and the tax-corrected real yield on common stock. The demand for money is interest inelastic but income elastic in the long run.

The model predicts the variations in the demand for money well. It predicts inside the sample period and forecasts outside the sample period with a high degree of accuracy. It outperforms in forecasts both the basic neoclassical and Goldfeld's model, reestimated with annual data.

The estimates of the parameters of the model remain stable as more variables are included or as the sample period is altered. Accordingly, it can be concluded that the demand for money presented in this paper is stable, meaning that the quantity of money demanded is predictable both inside and outside the sample period.

Footnotes

[1]Transactions and asset demands are often studied together in one model of the demand for money, e.g., William Baumol (1952) and Milton Friedman (1956, 1959). A portfolio approach to the demand for money was first developed in the seminal paper of James Tobin (1956). Anyone writing on the demand for money soon realizes that reviewing the literature on the demand for money in an introductory paragraph is an impossible task, owing to the vast number of papers — some major contributions — in this field. Thanks are due to the marvelous surveys of David Laidler (1977, 1978, 1980) and John Judd and John Scadding (1982).

[2]The data on tax yields were provided by Vito Tanzi.

[3]The data sources are the New York Stock Exchange, Dow Jones & Co., and the Standard and Poor's Corporation.

[4]These are the Livingston data, provided by the Federal Reserve Bank of Philadelphia.

[5]The data were derived from the Board of Governors of the Federal Reserve System, **Federal Reserve Bulletin**, various issues.

[6]The length of the lag in the adjustment mechanism is not known with certainty. On the contrary, some portfolio adjustments are very slow and do exceed one year. The adjustment mechanism is thus in line with annual data as well as with data of a higher frequency.

[7]The model is estimated with end-of-year data, for three reasons. First, the rate of after-tax earnings on common stock corrected for inflation was only available at this frequency. Second, the Livingston index of anticipated inflation is available for a twelve-month-ahead period in December and for six months ahead in June and December. The twelve-month-ahead rate, computed in December, was chosen in this paper, because participants in the survey attach special importance to this forecast. Third, tax rates on Treasury bill earnings are available from Vito Tanzi on a yearly basis only. Accordingly, no restrictive assumptions are needed to compute annual after-tax interest rates on Treasury bills. However, correcting monthly or quarterly yields for taxes based on Tanzi's data requires the assumption that each monthly or quarterly rate is identical to the annual rate.

There is little to be gained by estimating the model presented in this paper by quarterly rather than annual data. When quarterly data are used, as in the case of Goldfeld (1973), the following is usually observed: (1) real GNP is measured at an annual rate; (2) the interest rate is expressed at an annual rate; and (3) anticipated inflation is entered at an annual rate. Therefore, the estimates of the crucial parameters of Goldfeld's model — in particular, the speed of adjustment of money to its previous period's value — are of the same magnitude as those in this model, estimated by end-of-year data.

The only gain in using quarterly data is that more observations are available to conduct some specific stability tests requiring many observations. However, many valid stability tests presented in this paper do not require large samples. Moreover, if the model is stable — based on the stability tests presented in this paper — for small samples of annual data covering several business cycles, then it is surely stable when estimated on the basis of larger samples of quarterly data, covering the same period.

Goldfeld (1973) reports that measuring the money stock data by averaging the officially reported monthly data for the three months of the quarter, by average of the two months' data centered on the end of the quarter, by data for the last month of the quarter and by end-of-quarter point estimates from call report data, all yield quite similar estimates of the crucial parameters of the model.

Industrial production or real consumer spending is used as income variable in countries where monthly real disposable income data are not available, when the model is estimated on the basis of monthly data. It is noteworthy that the cyclical fluctuations in industrial production far exceed those in real GNP. Therefore, models of the demand for money using industrial production as a proxy for real income exhibit strong instability of the income elasticity when the latter is measured in different phases of the business cycle. Researchers may then conclude erroneously that the demand for money is unstable, while the valid conclusion is that industrial production is not an appropriate proxy for real income in the demand for money. Accordingly, real consumer spending is preferred to industrial production in demand for money models based on monthly data. The computation of the explanatory variables of the model estimated in this paper precluded the use of monthly data.

[8]Although we know little about the exact nature of this adjustment mechanism, it is considered acceptable in both annual and quarterly models of the demand for money. S. Goldfeld (1973) states: "The exact nature of the cost of adjustment involved is much less clear in adjusting financial portfolios than in the case of adjusting stock of machinery and plant."

[9]The share of government in total economic activity has steadily been rising. Accordingly, when the uncorrected RGNP is used rather than RGNPC, the long-run income elasticity of the demand for money drops to 1.14, which approaches unity.

[10]From these results, it could hastily be concluded that the neo-classical contention — i.e., that the demand for money is virtually unitary income elastic but completely interest inelastic — is readily supported. However, the **global** interest elasticity of the demand for money matters, not merely its elasticity with respect to changes in the after-tax Treasury bill rate. Since most interest rates move together during the different phases of the business cylce, a one percent rise in all rates has a **large** combined impact on the demand for money, as investors move out of money and into several financial assets. Assuming a short-run interest responsiveness of the demand for money of −0.025 with respect to changes in after-tax real rates of return on Treasury bills, 90-day commercial paper, common stock and corporate bonds, the global long-run interest elasticity of these four assets implied by this paper would be approximately −0.42. This would obviously lower the long-run income elasticity of the demand for money somewhat, bringing its value closer to unity. Unfortunately, introduction of more than two interest rates in the demand for money equation would create an unnecessary problem of multi-collinearity. Goldfeld (1973) always tests for pairs of interest rates in the demand for money. However, if several after-tax real interest rates could be introduced in the demand for money, the long-run income elasticity would drop below unity and the demand for money would be more interest elastic, in a global sense, than indicated in this paper.

References

Baumol, William J., "The Transactions Demand for Cash: An Inventory Theoretic Approach," **Quarterly Journal of Economics, 66** (November, 1952), No. 4, pp. 545-556.

Cochrane, D. and G.H. Orcutt, "Applications of Least Squares Regressions to Relationships Containing Autocorrelated Error Terms," **Journal of the American Statistical Association,** 1949, pp. 32-61.

deMenil, Georges, "Rationality in Popular Price Expectations," Princeton University, August, 1973, processed.

Durbin, J. and G.S. Watson, "Testing for Serial Correlation in Least Squares Regression," **Biometrika, 37** (December, 1950), pp. 409-28 and **38** (June, 1951), pp. 159-178.

Friedman, Milton, "The Demand for Money: Some Theoretical and Empirical Results," **Journal of Political Economy, 67** (August, 1959), pp. 321-351.

_______________, "The Quantity Theory of Money, A Restatement," **Studies in the Quantity Theory of Money,** ed Milton Friedman. Chicago: University of Chicago Press, 1956, pp. 3-24.

Goldfeld, Stephen M., "The Demand for Money Revisited," **Brookings Papers on Economic Activity,** 1973:3, pp. 577-638.

Johnson, Harry, **Macroeconomics and Monetary Theory.** London: Aldine, 1972.

Judd, John P. and John L. Scadding, "The Search for a Stable Money Demand Function: A Survey of the Post-1973 Literature," **Journal of Economic Literature, 20** (September, 1982), pp. 993-1023.

Keynes, John Maynard, **The General Theory of Employment, Interest and Money.** New York: Harcourt, Brace and Company, 1936.

Kimball, Ralph C., "Wire Transfer and the Demand for Money," **New England Economic Review,** March/April, 1980, pp. 5-22.

Laidler, David E.W., "The Demand for Money in the United States - Yet Again," Carnegie-Rochester Conference Series on Public Policy, **On the State of Macro-Economics,** ed. Karl Brunner and Allan H. Meltzer. Amsterdam: North Holland, 1980, pp. 219-271.

_______________, **The Demand for Money: Theories and Empirical Evidence.** 2nd edition. New York: Dun Donelley Publishing Corporation, 1977.

_______________, "Money and Money Income: An Essay on the Transmission Mechanism," **Journal of Monetary Economics, 4** (April, 1978), no. 2, pp. 151-191.

Theil, H., **Principles of Econometrics.** New York: John Wiley and Sons, 1971.

Tobin, James, "The Interest-Elasticity of the Transactions Demand for Cash," **Review of Economic Studies, 38** (August, 1956), pp. 241-247.

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