

## Some Comments on the Stability of the Demand for Money

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The stability of the demand for money is of fundamental importance in theoretical discussions and of great relevance for the implementation of monetary policy. The validity of the monetarist or the neo-Keynesian interpretation of the transmission mechanism of monetary impulses decisively depends on the predictability of the liquidity preference of the economy. The significance of the relative stability of the monetary sector for the optimal choice of the monetary instrument can be regarded as received wisdom since *Poole's* (1970) analysis.

In sharp contrast to the dominant role of this characteristic of the demand for money for economic theory and policy stands our quite rudimentary knowledge about it. This is even more surprising as a multitude of empirical estimates of the demand for money exists. The Keynesian system with its almost total neglect of monetary or financial structure, where neither a banking system nor differentiated markets for money and securities exist, bears to a large measure responsibility for this state of affairs. The whole range of behavioural and structural changes which occur in the markets for money and securities can only affect, directly or indirectly, the demand for money. The implications of this restrictive assumption were recognised by *Brainard* (1964). However, his contribution has been virtually ignored. This is all the more deplorable as his model of the monetary and banking sectors is eminently suitable for the analysis of structural changes such as technological progress, financial innovations or alterations in asset preferences by investors.

In a recent article *Sharpe and Volker* (1979), henceforth referred to as SV, criticise estimates made by us for the demand for money (1974) on the grounds of alleged instability. They argue that the perceived instability arises from the neglect of certain institutional factors considered to be relevant over the sample period, namely, (see p. 112),

- (i) the movement towards a somewhat more market oriented policy and competitive banking system in the early 1960's,
- (ii) the loss of effective control over the money supply from 1952 to 1956 and
- (iii) the imposition of direct lending controls on banks.

However, the manner in which SV perceive these institutional factors as operating, makes it very doubtful whether the continued use of a single equation approach is justified. It consequently appears to us highly probable that all of their stability tests and other empirical analyses are invalid.

Before enlarging on this we revert back briefly to our original equation which expressed the demand for money as a function of the interest rate, income and price expectations. The implicit assumption of this structure is that the interest rate is an exogenous variable, controlled by the monetary authorities, and that the supply of money is allowed to adjust to the quantity of money demanded at the set rate of interest. In other words, the supply of money is perfectly elastic, at every level of interest rate. The nature of our estimated money-demand relationship may best be demonstrated with the help of the following general system:

$$(1) \quad M^D = a_0 + a_1Y + a_2r + a_3p^e + u$$

$$(2) \quad M^S = b_0 + b_1R + b_2r + v$$

$$(3) \quad M^D = M^S$$

The demand for money depends on income ( $Y$ ), the interest rate ( $r$ ) and price expectations ( $p^e$ ); the supply of money is a function of bank reserves ( $R$ ) and the interest rate,  $r$ . Equation (3) represents the equilibrium condition. Now, when the interest rate is the policy variable we substitute equations (1) and (2) into (3) and solve for bank reserves. The resulting expression for  $R$  is substituted into the money supply equation, obtaining a reduced-form equation of the above system which is the same as the demand equation (1):

$$(4) \quad M = a_0 + a_1Y + a_2r + a_3p^e + u$$

It is important to stress that the structural model comprising equations (1) to (3), formed, in principle, the basis for our estimating equation. It was considered that this structure was a reasonable ac-

curate representation of how the market operated and how monetary policy was implemented over the sample period. Indeed we are able to quote as evidence from a Reserve Bank model (W. E. Norton et al. 1970, p. 9), "... for several markets ... the interest rate is defined as exogenous and the supply equation is dropped. The interest rates on deposits, for instance, are essentially set by the authorities as a policy decision."

We certainly do not consider such a structure to be appropriate in the period since 1973, when changes in the money supply have been anything but passive, and consequently we could not expect the equation to predict particularly well into this period. However, for our sample period 1952 (1) to 1972 (3), it was assumed that the authorities controlled the interest rate and not the supply of money. In other words, our formulation of the demand equation assumes that the authorities never had control of the money supply. SV's concern about an institutional change in 1952 - 56 which is described as a "loss of effective control over the money supply by the authorities" means that our structure is indeed very well applicable during 1952 - 56.

In their revised formulation SV attempt to capture the effect of this "loss of control over the money supply" during 1952 - 56 by including a proxy variable equal to the rate of growth of the liquidity augmented money base. The logic of this approach is elusive. It would appear that if 1952 - 56 was the period when the authorities lost control of the money supply, the variable proxying the influence of shifts in supply, in so far as it is applicable at all, would be applicable in the remainder of the sample period, when by implication, the monetary authorities had control of the money supply.

The implication that the monetary authorities had control of the money supply after 1956 also raises the question about the exogeneity of the interest rate and the validity of the continued use of a single equation model in which the interest rate appears as one of the independent variables. In equilibrium, the authorities cannot control both the interest rate and the supply of money. They could conceivably do so in a disequilibrium situation but it seems highly unlikely that they would be fully successful. If the interest rate is responsive in any way at all to supply changes in the same quarter, regardless of whether equilibrium exists or not, the interest rate will be correlated with the disturbance term, yielding biased estimates. More importantly perhaps,

from the point of view of SV's criticism, the residuals from such an equation cannot be validly used in stability tests.

In discussing the influence of supply shifts, whether they originated in the somewhat obscure fashion mentioned above or from direct controls on bank lending, SV do postulate the existence of temporary disequilibrium. They suggest the disequilibrium is a result "of the inflexibility of the rate of interest which prevented new equilibria being attained in the same quarter as the supply curve shifted" (p. 113). As already mentioned, the non-attainment of a new equilibrium in the same quarter is not a sufficient condition for the validity of the single equation approach. For this to be so the interest rate must be completely inflexible in response to supply shifts in the same quarter. Any movement at all towards the new equilibrium in the same quarter invalidates the single equation approach. SV did not broaden their model to test for simultaneity. Given the nature of their a priori reasoning it seems most unlikely that their theoretical approach is consistent with their empirical formulations. In other words, if their a priori reasoning is correct, there is a high probability that all of their empirical analyses including their stability tests, are meaningless.

There appear to be problems also with the way in which SV have taken into account their first institutional factor, "the movement towards a somewhat more market oriented policy". They hypothesise (p. 113) "that the trend away from or towards money is related to the degree of competitiveness of bank liabilities". The degree of competitiveness is proxied by the differential between the bond rate and the yield on bank liabilities (R-RFD), which is included as one of the independent variables. They report significant results with the coefficient having the expected negative sign. However, the logic underlying the precise form in which the variable is included is obscure and casts doubt on the validity of the results. All other variables in the equation are expressed in terms of first differences, but the differential, R-RFD, is expressed in levels. The change in the demand for money is postulated to be a function of the level of R-RFD. In other words, a once-and-for-all reduction in the level of the differential will cause the demand for money to perpetually increase. While there may be some lags in adjusting to a new differential, this sort of relationship appears to be theoretically insupportable. The usual hypothesis is that both variables are expressed in levels or both in differences. The fact that the explanatory variable is a differential between two interest



rates is not relevant, since it would be just as valid theoretically to include both interest rates as separate explanatory variables. The fact that they are included in the form of a differential merely constrains the estimated influence of each to the same magnitude but of opposite sign.

In summary, while SV have presented a priori reasons for believing that the demand for money may have been influenced by certain institutional changes over the sample period, the inconsistency of their derived estimating equations with their a priori reasoning means that very little confidence can be placed in their empirical results, including all of their stability tests.

### References

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### Zusammenfassung

#### Einige Anmerkungen zur Stabilität der Geldnachfrage

Die Relevanz der Geldnachfrage und ihre Stabilität hinsichtlich des effektiven Einsatzes der Geldpolitik wurde bereits ausgiebig dargestellt; empirische Schätzungen und Tests der Stabilität sind Legion. Die theoretische Basis für diese empirischen Tests variierten beträchtlich sowohl hinsichtlich des Zeitfaktors als auch von Untersuchung zu Untersuchung, wobei das Ergebnis sowohl von dem theoretischen Wissensstand als auch von der Struktur und Eigenarten der verschiedenen monetären Systeme abhing. Dieser Beitrag hebt besonders hervor, wie wichtig die Notwendigkeit der Konsistenz ist zwischen den theoretischen Behauptungen einerseits und der präzisen Form andererseits, mit der sie empirisch getestet werden.

Derartige Widersprüche verringern den Nutzen sowohl der empirischen Gleichungen als auch die Aussagekraft der Stabilitätstests. Vor diesem Hintergrund werden einige empirische Hypothesen über die Geldnachfrage in Australien untersucht.

## Summary

### Some Comments on the Stability of the Demand for Money

The relevance of the demand for money and its stability for the effective implementation of monetary policy has been well documented; empirical estimates and tests of stability are legion. The theoretical bases for the empirical tests have varied considerably both over time and from one study to another, depending on both the state of theoretical wisdom and the structure and idiosyncrasies of particular monetary systems. This paper emphasises the importance of the need for consistency between the theoretical assertions, on the one hand, and the precise form in which they are empirically tested on the other.

Inconsistencies of this nature render both the empirical equations and the associated tests of stability of little worth. It is against this background that some empirical formulations of the demand for money in Australia are examined.

## Résumé

### Quelques observations sur la stabilité de la demande monétaire

L'importance de la demande monétaire et de sa stabilité dans l'intervention effective de la politique monétaire a déjà été abondamment illustrée; les évaluations et tests empiriques de la stabilité sont légion. Les bases théoriques de ces tests empiriques ont largement divergé tant en ce qui concerne le facteur temps que d'une enquête à l'autre, le résultat dépendant aussi bien de l'état théorique de la science que de la structure et des particularités des divers systèmes monétaires. Cette étude souligne en particulier l'importance de la nécessité de la consistance entre d'une part les affirmations théoriques et d'autre part la forme précise par laquelle celles-ci sont empiriquement testées.

Pareilles contradictions réduisent l'utilité des équations empiriques comme celle de la signification des tests de stabilité. Sur cette toile de fond, quelques hypothèses empiriques sont examinées concernant la demande monétaire en Australie.