
AN INVESTIGATION OF MONETARY TARGETS IN A NEW ZEALAND CONTEXT 1981-1986

Discussion Paper G89/6 –
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In this paper we assess the suitability of several monetary and credit aggregates as intermediate target variables of monetary policy over the period 1981-1986. The aggregates are primarily evaluated on the basis of the strength, stability and direction of causality of their relationship with nominal economic activity. Three methods of evaluation are used: Granger causality tests, St. Louis reduced form regressions (both of which test the linkages in the short run) and the cointegration technique (which tests the long run linkage). The main result from this paper is that none of the aggregates conventionally advocated as targets meet the evaluation criteria listed above (which is in contrast with previous New Zealand studies). The implication for monetary policy is that none of the monetary or credit aggregates would have been suitable intermediate target variables for monetary policy over the period 1981-1986.

We find that Domestic Credit meets some of the evaluation criteria, but has some major drawbacks as a target variable. The reduced form results for the aggregate show that it is a significant explanatory variable of nominal activity. Furthermore, the results from the analysis of the long run relationship show that Domestic Credit and nominal GDP are cointegrated (that is, they are related in the long run), with causality running both ways between the two aggregates. Most importantly, Domestic Credit is found to influence nominal GDP. A problem with the long run result is that Domestic Credit and nominal GDP do not exhibit a one to one relationship: a ten per cent change in Domestic Credit leads to a seven per cent change in nominal GDP whereas, on theoretical grounds, we would expect a ten per cent change in nominal GDP to result.

Two further caveats should be mentioned. First, no evidence of causality between the variables can be found in the short run Granger causality tests indicating that a stable short term linkage does not exist even though a long term relationship does exist. However, since this relationship is likely to be distorted by exogenous influences, a mechanical response of the price level to changes in Domestic Credit cannot be expected. Secondly, disaggregation of Domestic Credit into Private Sector Credit and Government Credit indicates that nominal GDP has a different short run response to the two components. In particular, movements in nominal GDP are negatively correlated with movements in Government Credit in the short term (although positively correlated in the long run) suggesting some form of crowding out.

The M3 aggregate also passes some of the evaluation criteria. In particular, the results from the long run analysis are encouraging, although again, a one to one relationship is not found. M3 is found to influence both nominal GDP and Domestic Credit in the long run. However, the reduced form analysis finds M3 to be a poor target in terms of its short run explanatory power on nominal GDP. The reduced form equation estimated for M3 also fails a number of *a priori* requirements. The Granger causality results also suggest that M3 has some shortcomings as a target variable.

In contrast to Domestic Credit and M3, we find that M1 is a useful short run target variable, with movements in M1 partially reflected in nominal GDP within two or three quarters. In the long run however, growth in M1 is caused by growth in nominal GDP and is therefore demand determined. This latter fact limits its use as a target variable to control inflation. However, M1 may be a useful indicator, given that nominal GDP is only measured quarterly and with a long lag, while M1 is published each month and is much more timely.

* The contribution by Andrew Coleman was made while he was still in the employ of the Reserve Bank of New Zealand.

MONEY AND CREDIT DEMAND IN NEW ZEALAND: 1973-1986

*Discussion Paper G89/7 –
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Considerable attention has been paid to monetary and credit aggregates in the theoretical and empirical economics literature in recent decades. During the 1970s and 1980s many countries adopted targets for one or more aggregates on the basis of the existence of a close stable relationship between rates of growth in an aggregate and developments in the ultimate objective e.g. inflation or nominal income. More recently, such targets have been either abandoned or played down in many countries, as previously apparently stable empirical relationships have broken down.

In this paper, the New Zealand data is examined to test whether stable demand relationships for any of the aggregates existed over the sample period (1973-1986), as an indication as to whether any of the aggregates would be suitable for use by the Reserve Bank as either leading indicators or intermediate targets. Long-run equilibrium and short-run dynamic equations for the demand for various money and credit aggregates were estimated using the two-stage error-correction model estimation approach developed by Engle and Granger.

The most favourable results were found for the narrower monetary aggregates. Real consumption, short-term interest rates and technological innovation were found to be important factors in determining the long-run real demand for notes held by the public and for real M1 transactions balances. However, the real demand for notes held by the public was found to be negatively related to the real share price index and the inclusion of this variable was necessary to establish an acceptable long term relationship among the variables tested; this result could not be satisfactorily rationalised and consequently draws the results for that equation into question.

The long-run demands for M3, M3 excluding demand deposits, and Private Sector Credit were found to be related to real consumption and real investment. However, these functions were unstable and could not be adequately identified using the single equation estimation techniques which were applied. The cause(s) of the instability could not be isolated, but it was concluded that the dramatic structural changes to the financial sector and the subsequent financial innovations that have taken place over recent years were undoubtedly factors contributing to the difficulty in identifying the underlying determinants of these aggregates.

This paper concludes that on the basis of the empirical evidence, only the narrow aggregates could be considered for use as indicators of monetary conditions, and that in practical terms even these aggregates will be of little use for targeting purposes. The fact that the activity variable (consumption) included in both the notes and M1 equations moved contemporaneously with the monetary aggregates, suggested that the aggregates are not leading indicators of either changes in nominal or real economic activity. The only possible way in which these aggregates could be considered as leading indicators would be if the monetary aggregates data became available significantly more quickly than information about real and nominal activity. It was further concluded that unless the monetary authorities have reliable indicators which allow them to distinguish between changes in note or M1 demand which are due to changes in real activity (or other factors) and changes in note or M1 demand which are associated with changes in the price level, the narrow aggregates will be of little use when assessing monetary conditions. The conclusions of this research are consistent with the Reserve Bank's practice of putting relatively little weight on the monetary and credit aggregates in the monitoring and assessment of monetary conditions.

MODELLING THE FINANCIAL ASSET HOLDINGS OF THE NON-BANK PRIVATE SECTOR IN NEW ZEALAND

*Discussion Paper G89/8 –
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This paper estimates the responsiveness of the non-bank private sector's demand for financial assets to changes in financial wealth and interest rates in New Zealand. The degree of substitutability between money and other financial assets plays an important role in determining the effectiveness of a policy of monetary aggregate targeting if such a policy were to be adopted. Traditionally, monetary authorities have wished to target a monetary aggregate which has a predictable relationship to a nominal macro-economic aggregate (e.g. nominal wealth, nominal income or the price level) and which shows little, if any, responsiveness to interest rate changes or to movements in other variables. The reason why an aggregate that is responsive to interest rate changes is not suitable as a strict monetary target is that it becomes difficult, in such a case, to interpret changes in the aggregate. One cannot adopt a strict growth rate target for such an aggregate because if interest rates change, real demand for the aggregate will change and if monetary policy is used to keep the nominal aggregate on target, the result will be an undesired shift in the price level.

In estimating the responsiveness of asset demands to interest rate and wealth changes, we have utilised a portfolio specification (based on consumer theory's so-called 'Almost Ideal Demand System') which considers the interactions between all the variables concerned. Our use of the cointegration estimation technique enables the long-run equilibrium relationship between the financial variables to be estimated along with the short run dynamic relationships.

Our estimates suggest that the adoption of a strict monetary aggregate target may not be appropriate in New Zealand for two reasons. Firstly, the explanatory power of the estimated equations is not as high as would be desirable if a strict targeting approach were to be adopted. Lack of a high degree of explanatory power for the equations means that there is considerable leeway in the money-price relationship, even after accounting for the influence of other factors such as interest rates. However, based on explanatory power, one would prefer to target M1 or M3 rather than a larger aggregate which includes government security holdings.

In terms of interest rate responsiveness, M3 appears a preferable target to M1, particularly when there is an across-the-curve rise in rates. If both short and long rates rise equally by one percentage point, M3 is estimated to remain unchanged, whereas M1 falls by almost 8 per cent. However, M3 does vary if only short or long rates change (and especially if they change in opposite directions), so that M3 is not as suitable a target for monetary policy when the yield curve is tilting. The potential for interest rate changes to influence M1 and M3 holdings, together with the substantial short-run residuals that remain unexplained, points to each of M1 and M3 being retained solely as an indicator within a wider checklist of monetary conditions, rather than being elevated to the status of an intermediate target of monetary policy.

* The contribution by Chris Meads was made while he was still in the employ of the Reserve Bank of New Zealand.