MONEY AND ECONOMIC ACTIVITY: SOME ALTERNATIVE RESULTS

G. D. I. Barr* and B. S. Kantor†

In their paper "Monetary Aggregates and Economic Activity in South Africa — some Preliminary Findings", M. J. Driscoll, J. J. A. du Plessis and J. L. Ford[1] stress "that the existence or otherwise of a stable and predictable relationship between money and economic activity in South Africa remains an empirical issue" (p. 217). In Section 3 of their paper they tested the impact of ten alternative measures of money on gross domestic product (GDP), this being regarded as the best proxy for economic activity in South Africa.

Having failed to find, "except in a few isolated and unimportant cases, any statistically significant effects of monetary aggregates beyond the current period" (p. 225), the authors tested the effects of contemporaneous changes in money on GDP by means of ordinary least squares regression analysis. The R^2, the coefficient of determination obtained from these regression equations, was then used to rank the importance of different monetary aggregates.

The authors' attempt to measure the effects of changes in money and of different monies by their impact on changes in GDP is, however, a questionable one. Having observed that money supply changes may have different effects in a closed and open economy context, the authors then ignore this important distinction. In a small open economy gross domestic expenditure (GDE) is of course not identical with GDP, the difference being equal to the surplus or deficit of exports over imports. The South African economy is exceptionally open to world trade and differences between exports and imports can be large relative to GDP. Therefore changes in South African GDP may be influenced to an important extent by foreign demand for South African goods quite independently of South African monetary developments. Thus, while money has important effects on GDE, and hence on GDP by definition, the link between money and GDP can be predicted to be more tenuous than that between money and GDE.

To examine this issue in greater depth, equations relating the growth rate of nominal GDP, nominal GDE and consumption expenditure to the growth rates of

various monetary definitions were estimated using quarterly data over the period I/1965-III/81. The alternative definitions of money used were:

(i) M1 (Coin and bank notes in circulation outside the banking sector plus demand deposits with the banking sector excluding foreign deposits and government deposits).

(ii) M2 (M1 plus short term and medium term deposits with the banking sector but excluding foreign deposits and government deposits).

(iii) M2A (M2 + Building Society savings deposits).

(iv) M2B (M2A + Building Society fixed deposits).

The results are published below. The equation tested is the following:

$$\dot{Y}_t = \text{Constant} + \Sigma_{i=0}^{4}\ m_i\ \dot{M}_{t-i}$$

Table 1 *Estimates of the Parameters of the Equation for Various Y, M*

Y_t \ M_t		M1	M2	M2A	M2B
Consumption Expenditure	Constant	9,061(12,49)	8,093(7,201)	7,487(6,94)	7,015 (5,96)
	m_0	0,199(2,49)	0,441(3,99)	0,473(4,24)	0,481(4,15)
	m_1	0,050(0,74)	0,055(0,53)	0,061(0,57)	0,061(0,56)
	m_2	0,012(0,15)	−0,134(1,30)	−0,128(1,24)	−0,109(1,01)
	m_3	0,128(1,21)	0,637(0,37)	0,088(0,50)	0,129(0,70)
	m_4	0,030(0,31)	0,013(0,09)	−0,025(0,17)	0,052(0,34)
	Σm_i	0,422(8,50)	0,440(5,89)	0,468(6,67)	0,510(6,47)
	$\overline{R}^2$	0,630	0,539	0,603	0,603
Gross Domestic Expenditure	Constant	4,579(2,55)	3,044(1,11)	2,207(0,823)	1,303(0,443)
	m_0	0,198(1,00)	0,421(1,56)	0,443(1,59)	0,513(1,77)
	m_1	0,243(1,44)	0,309(1,22)	0,361(1,35)	0,351(1,27)
	m_2	0,127(0,65)	0,164(0,65)	0,222(0,86)	0,200(0,74)
	m_3	0,025(0,09)	0,106(0,25)	0,177(0,26)	0,163(0,35)
	m_4	0,296(1,24)	−0,117(0,33)	−0,233(0,66)	−0,236(0,62)
	Σm_i	0,892(7,27)	0,883(4,85)	0,911(5,24)	0,992(5,04)
	$\overline{R}^2$	0,525	0,423	0,482	0,475
Gross Domestic Product	Constant	10,564(6,406)	11,520(4,72)	10,894(4,49)	10,979(3,994)
	m_0	0,450(2,48)	0,412(1,71)	0,483(1,92)	0,484(1,78)
	m_1	0,047(0,30)	0,117(0,52)	0,144(0,60)	0,064(0,25)
	m_2	−0,197(1,10)	−0,120(0,54)	−0,129(0,55)	−0,145(0,57)
	m_3	−0,022(0,09)	−0,078(0,20)	−0,089(0,22)	0,035(0,08)
	m_4	0,081(0,37)	−0,071(0,23)	−0,119(0,37)	−0,144(0,40)
	Σm_i	0,360(3,19)	0,258(1,59)	0,288(1,83)	0,295(1,60)
	$\overline{R}^2$	0,230	0,128	0,191	0,125

Fourth order percentage changes of Y and M were used to remove seasonality and proxy the first derivatives. A fourth degree Almon polynomial was applied with both end-points constrained. Absolute value of t-statistics appear in parentheses (values in excess of 2,009 are significant at the 5 per cent level for these tests). $\overline{R}^2$ is the coefficient of determination corrected for degrees of freedom.

The statistical procedure is similar to that applied recently by R. W. Hafer,[2] and similar also to the now very well known St Louis reduced form testing approach developed originally by L. C. Anderson and J. L. Jordan at the Federal Reserve Bank of St Louis.[3]

Our results are in line with modern quantity theory indicating a strong link between the various monetary aggregates and consumption and GDE, but a much weaker link between the monetary aggregates and GDP. Thus although the latter part of this conclusion is in line with Driscoll *et al.*, it underlines the importance of treating South Africa in an open economy context when measuring economic relationships.

In addition, it is of some interest to note that for the alternative definitions of money used in this study there were no marked differences in their effects on the various dependent variables, a result which is in contrast to those of Driscoll *et al.* (for the monetary aggregates used in that study).

University of Cape Town

2 Hafer, R. W. Much Ado about M2. *Federal Reserve Bank of St. Louis Review*, October 1981, Vol. 63, No. 8, pp. 13-18.

3 Leonall C. Anderson and Jerry L. Jordan. Monetary and Fiscal Actions. A Test of their Relative Importance in Economic Stabilization. *Federal Reserve Bank of St. Louis Review*, November 1968, pp. 11-24.