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## ARTICLES

# The use of money and credit measures in contemporary monetary policy

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The changing interaction between economic and financial developments around the world is prompting lively debate in the academic and central banking community about the use of money and credit measures in contemporary monetary policy formulation. Currently, money and credit measures generally have a fairly low, but arguably increasing, profile in the panoply of models and economic indicators used in central banks' assessments of the economic outlook. Some prominent academics and central banks advocate increased emphasis on money and credit measures. In this view, credit developments in particular can materially enrich our understanding of the economic outlook when financial asset markets and the price of credit risk are moving substantially. At the same time, there are prominent sceptics on the specific value of money in understanding and predicting inflation. In New Zealand monetary policy formulation, we tend to focus on disaggregated credit measures, and mostly to provide corroborating information about particular developments in the various sectors of the economy. Increasing international financial integration and a greater emphasis on the interaction between financial stability assessment and monetary policy may see increased use and profile of credit measures in the future.

## 1 Introduction

There is a large and long-running literature, going back hundreds of years, on the role of money in the inflation process and in monetary policy.<sup>1</sup> In modern central banking practice, the role of money has shifted markedly in recent decades. In the late 1960s and 1970s, the 'monetarist' approaches widely adopted around the world placed the supply of money at the centre of monetary policy implementation. The mainstream of monetary policy practice then shifted to use of a short-term interest rate as the instrument, with money measures taking more of a background indicator role, along with credit, in assessments of inflation pressure and economic prospects. Today, some central bankers and researchers argue for renewed attention to money and credit as essential elements of economic dynamics. There is no suggestion that there should be a return to the targeting of money supply as the centrepiece of monetary policy, but there is an assertion that money and credit behaviour is becoming a more important driver of economic cycles, and has been unduly neglected in macroeconomic analysis.

This article looks at the arguments for raising the profile of money and credit measures in economic analysis, and places them in the context of the trends in modern monetary policy conduct. The article proceeds as follows. Section 2 briefly reviews the relevant literature and several decades of monetary policy practice concerning money and credit measures, including the New Zealand case. Section 3 summarises the arguments for giving greater profile to money and, particularly, credit articulated by a prominent researcher and former central banker, Charles Goodhart. We also summarise a sceptical view on the usefulness of looking at money (specifically) provided by another prominent researcher and adviser to central banks, Michael Woodford. Section 4 takes a quick look at the basic facts in the New Zealand money and credit data, and the degree to which Goodhart's and Woodford's arguments are supported by the evidence here. Section 5 summarises and notes some directions for further work and research.

## 2 Money and credit in modern central banking practice

### 'Monetarism'

Milton Friedman has generally been given the intellectual credit for the emergence of money into the limelight

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<sup>1</sup> This literature includes a remarkably insightful but little-known contribution by Nicholas Copernicus in the sixteenth century, 200 years before the classical economist David Hume's formal exposition of the Quantity Theory of Money (Taylor, 1955).

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of monetary policy, during the late 1960s and 1970s.<sup>2</sup> Policymaking in the previous three decades had been dominated by the 'Keynesian' emphasis on government spending, rather than monetary policy, as the primary means by which macroeconomic activity should be regulated. Keynesian policy was unable to cope with the persistent and sustained rise in both unemployment and inflation ('stagflation') worldwide in the early 1970s, paving the way for the spread of 'monetarism' and its focus on the supply of money as the primary macroeconomic stabilisation instrument.<sup>3</sup>

Monetarist monetary policy was built conceptually around the much older Quantity Theory of Money, which is an identity noting that the stock of money (M) times its velocity of circulation (V) equals the level of the economy's nominal output (ie, the price level (P) times real output (Y)):  $MV=PY$ . Expressed in growth rate terms, the Quantity Theory implies (with rearrangement of the terms) that inflation is equal to money growth plus the change in velocity minus real growth.

Using this relation, among other things, monetarists typically cited Friedman's assertion that inflation was "always and everywhere a monetary phenomenon"<sup>4</sup> in support of policies that would hold money growth close to the real growth rate – on the expectation that, if velocity was roughly constant, then inflation would remain close to zero. For example, if real GDP is growing at 4 percent, velocity is constant and money is made to grow at 6 percent, then inflation should be 2 percent.

Policymakers adopted monetarist ideas partly because of the deficiencies of the Keynesian framework in stagflationary circumstances as noted above, and partly because a new way of anchoring prices in the economy was needed following the widespread move to floating exchange rates after the collapse in the early 1970s of the Bretton Woods framework of fixed exchange rates between the major economies. Under monetarism and floating exchange rates, the supply of money became each economy's 'nominal

anchor'. Policymakers' intent was to control the rate of inflation through controlling the rate of money supply within narrow ranges.<sup>5</sup>

In terms of inflation outcomes, the success of money targeting based on the Quantity Theory required that velocity of circulation (V) be predictable, and remain so in the face of policymakers attempting to manipulate the money supply (eg, by 'targeting' it). In the 1980s, financial deregulation and innovation destabilised velocity to the point where money targeting generally became unviable. The succession of research findings<sup>6</sup> on the dynamics of money measures in New Zealand led to broadly the same conclusions as those reached elsewhere at around the same time. Most central banks abandoned money targeting during the 1980s. The replacement framework was typically the use of a short-term interest rate as the operating instrument, which would be adjusted in response to developments in the variables of ultimate interest, growth and inflation.

By this time, the importance of inflation expectations in the dynamics of growth and inflation (asserted by Friedman also, 1968, and independently by Phelps, 1967) had been accepted by policymakers. Though monetarism's policy prescription of targeting money was abandoned, the broader intellectual framework around it remains a lasting legacy. This framework includes the generally accepted principles that the primary role of monetary policy is to control inflation, that inflation expectations matter, and that a central bank can and should be held accountable for inflation outcomes. Monetarist monetary policy helped focus attention on the importance of a verifiable commitment by the central bank to anchor inflation expectations. Money targeting was a fairly transparent and simple example of this kind of commitment rule (Woodford, 2007a).

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<sup>2</sup> For example, Friedman (1956), Friedman (1960), Friedman (1963) and Friedman and Schwartz (1963).

<sup>3</sup> See Johnson (1971) for a useful discussion.

<sup>4</sup> Friedman (1968), cited in Hetzel (2007, p 5)

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<sup>5</sup> For example, in the early 1970s the US Federal Reserve operated 'tolerance ranges' for the M1 (narrow money) and M2 (slightly broader) measures (Poole, 2000; also see Bernanke, 2006). In 1979, this approach was strengthened by a directive from the US Congress that the Fed should "maintain long run growth of money and credit... so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates" (Bernanke, 2006, p 2).

<sup>6</sup> See, for example, Spencer (1980), Coleman and Cruse (1989), Greville (1989), Tait (1989), Grimes and Wong (1992), Eckhold (1994), Siklos (1995), Siklos and Eckhold (1997), and Razzak (2001).

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## Current monetary policy practice

Today, despite money's relegation to the background of monetary policy, most developed-country central banks continue to include measures of money and credit in the range of economic indicators used to assess the economic outlook.

The Reserve Bank of New Zealand's view, for example, is well-expressed by Collins *et al.* (1999, p 8): "interpreted judiciously, money and credit aggregates may be useful economic indicators, and hence a useful addition to the central banker's analytical toolkit". Nowadays, the Reserve Bank gives money measures fairly limited attention from the point of view of formal modelling and forecasting, but credit market developments are monitored and contribute to the shaping of the economic outlook.

Recent editions of the Reserve Bank's *Monetary Policy Statement* contain more discussion of credit market developments than usual, reflecting the unusual circumstances in global credit markets currently. In earlier editions of the *Statement* (eg, December 2004), the Reserve Bank has discussed the implications for monetary policy conduct of, for example, competitive conditions in the mortgage lending market and shrinkage of mortgage interest rate margins. The Governor has also discussed the implications of sustained house price inflation and associated strong growth of credit and leverage (Bollard, 2004).

Over time, the Reserve Bank has shifted its attention away from the very broad system-wide aggregates such as private sector credit (PSC), and towards various credit measures disaggregated by borrowing sector (household, rural, business, etc.) or type of financial institution (bank, non-bank, etc.). This shift reflects partly that the disaggregates have only recently become acceptably reliable, partly that predictive ability is better at the sectoral level, and partly because of the increased attention to financial stability issues. The Reserve Bank's research on the use of very large sets of data to forecast major macro variables such as GDP and inflation (eg, Matheson, 2007) suggests that when tested as part of a set of data containing a large range of available economic indicators, money and credit measures appear

to add little additional predictive information for the major macro variables, even allowing for speed of publication.

Money and credit measures disaggregated by sector, on the other hand, are in fairly active analytical use. Money and credit measured at the household level and across different types of financial institution are used to shed light on trends in household investment, deposit and housing transaction behaviour.<sup>7</sup> The housing credit measures supplement information from building consents and house sales data in the formation of the Reserve Bank's view about housing market developments, and farm and business credit are used similarly in respect of their respective sectors. Also, the Reserve Bank has begun sourcing and analysing housing loan approvals data from banks, and this information also supplements our assessments of housing market prospects (Barrow, 2008). Though the predictive content of the disaggregates is mostly quite limited from a statistical point of view, they do enrich our assessments.

Generally speaking, other central banks appear to take a similar approach to ours of using money and credit measures as corroborating information about demand pressures. For the US Fed, "[a]ttention to money growth is ... sensible as part of [our] eclectic modelling and forecasting framework" (Bernanke, 2006, p 3). The level of attention to money and credit tends to vary depending on the economic circumstances at the time (see, for example, Longworth, 2003, on the Bank of Canada's approach). For most central banks, in general, the treatment of money and credit is fairly low-key compared to the attention given to direct indicators of activity and inflation such as GDP, retail sales, investment, the CPI, etc. The Bank of England gives a little more prominence to money and credit by devoting chapter 1 of its *Quarterly Inflation Report* to 'Money and asset prices'. Discussion there centres on the reasons for any changes in various monetary aggregates, and the potential implications for the inflation outlook (Hauser and Brigden, 2002).

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<sup>7</sup> See, for example, Smith's (2006) discussion of housing equity withdrawal.

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## The case of the European Central Bank

The European Central Bank (ECB) is worth some detailed discussion, as the major central bank that has given its analysis of money and credit most prominence. Its approach to monetary policy formulation has two 'pillars' – 'monetary analysis' and 'economic analysis'. The 'economic analysis' pillar is an approach to assessing the relevance of current economic and financial developments for the inflation outlook similar to that employed by other central banks (ECB, 2004). The 'monetary analysis' pillar is a framework with, on the surface at least, a distinctly monetarist flavour. In this pillar, M3 growth is compared with an explicit 'reference value' – currently 4½ percent p.a., set in December 1998 – which is based on an assumption about potential output growth (2 to 2½ percent), the trend in the velocity of circulation (-½ to -1 percent) and the ECB's inflation target (below 2 percent) (ECB, 2004).

The monetary analysis process "constantly reminds the central bank of the fundamental principle that, while responding to economic developments, it must never lose sight of the fact that, over sufficiently extended horizons, the role of money growth must be consistent with the price stability objective" (ECB, 2004, p 62). The ECB views monetary analysis as a 'cross-checking' device, helping it to see beyond the transient impact of various shocks hitting the economy, thereby helping to avoid setting monetary policy on a potentially destabilising course (Stark, 2006). The ECB has not found a solution to the problems of instability in velocity, and the monetary analysis framework has had to evolve over time to cope with these difficulties (Fischer *et al.*, 2006) – though this is of course true of almost any economic framework.

Though the ECB's two-pillar approach may place more rhetorical emphasis on money than other central banks, the approach may not be that different in substance (OECD, 2007). ECB (2000) notes that its approach "does not imply a partition of the information used for the analysis under the two pillars... analysis under both pillars aims at examining the available information in the best possible manner" (p 40). The ECB also states that deviations of money growth from the reference value would trigger further analysis,

rather than any particularly mechanistic response (eg, Stark, 2006).

This is not to say necessarily that rhetoric is not important. Issing (2006) places the adoption of the two-pillar approach in the context of the need to enhance the credibility of the new ECB upon the creation of the euro. He observes that the new central bank was created in a context of great uncertainty about prospects for the new currency zone and how it would perform, and about the behaviour of the new central bank. The two-pillar approach also provided some degree of conceptual continuity with the Bundesbank's strategy of money targeting prior to the creation of the euro, in the hope that the new currency might inherit some of the established credibility of the deutschemark.

## The case of the Bank of Japan

The Bank of Japan offers another interesting, more recent, approach. In the 1990s, Japan had to contend with a very long-lasting case of financial sector dysfunction, that strongly influenced macroeconomic analysis and policy. Dealing with this event led the Bank of Japan to adopt the Quantitative Easing Policy (QEP) in 2001, which involved targeting of the level of banks' current account balances at the Bank of Japan (Maeda *et al.*, 2005). At the time that the QEP was adopted, the official interest rate had already been set as low as possible, yet the economy was not responding adequately.

The QEP ended in 2006, with a return to an approach of setting an official interest rate. At this time, the Bank of Japan announced a new framework for the conduct of monetary policy. The new framework includes a "Two Perspective Strategy", which is stated to bear "some resemblance to the Two-Pillar Strategy at the European Central Bank" but "has a broader scope" (Nishimura, 2006, p 4). The first perspective is essentially an economic analysis framework similar to that of other central banks. The second perspective refers to "longer term" risks to the sustainability of price stability, and has been clearly influenced by Japan's financial system and financial stability issues of the 1990s. It is not clear, though, if money and credit measures are playing any particularly different role in the Bank of Japan's monetary

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policy formulation approach under the new framework, compared to their role in other central banks' approaches.

### Money and credit in central bank economic modelling

Though few, if any, central banks would suggest that they do not look at money and credit measures at all in their assessments of the economic outlook, the typical macroeconomic models in regular use for forecasting and monetary policy analysis generally incorporate little role for money or credit (Mishkin, 2007). This is despite quite rapid growth in the theoretical literature on incorporating credit market effects (the 'financial accelerator') more richly into dynamic macroeconomic models (eg Bernanke *et al.*, 1999), and an extensive literature on the role of banks and credit behaviour in transmitting changes in the official interest rate to the financial prices faced by households, firms and financial institutions (Nelson, 2003; Bernanke, 2007). Some of this literature looks specifically at the stock of money (controlling for the effects of the interest rate) within this process (eg Leeper and Roush, 2003; Reynard, 2007; Nelson, 2007).

The Reserve Bank's current central forecasting model, the Forecasting and Policy System (FPS), is not an exception in this respect. FPS includes no role for money or credit in influencing the dynamics of the other economic variables in the model. The next-generation "DSGE" model<sup>8</sup> we are currently developing as a potential replacement in our forecasting process goes a little further in that there is a credit supply effect, wherein the household's cost of borrowing (and hence its spending) is influenced by the loan-to-value ratio on its borrowing secured by housing. This effect can be interpreted as reflecting a collateral constraint on the quantity of external funding available to the household.

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<sup>8</sup> DSGE stands for "dynamic stochastic general equilibrium". See Karagedikli *et al.* (2007) for an overview of DSGE modelling research.

### 3 An argument for increased attention to money and credit measures

Though, as noted above, the majority of developed-country central banks tend to be fairly low key in their use of money and credit measures in monetary policy formulation, some central bankers and researchers are re-examining the role and usefulness of money and credit. This re-examination is prompted in part by changes over recent years in international economic and financial system dynamics, including generalised low inflation and macroeconomic stability, a sustained expansion of money and credit stocks worldwide, financial globalisation and the emergence of financial stability as a policy concern.<sup>9</sup> The current frictions in credit markets across the globe lend some contemporary relevance to this thinking.

An eminent expert on monetary policy and central banking, Charles Goodhart, succinctly presents some arguments for renewed attention to money and credit in a recent (2007) paper. He focuses in particular on credit, and argues that credit behaviour may provide useful information about the economic outlook if:

- changes in the financial system's propensity or ability to supply credit (due to, for example, changes in banks' risk preferences) are economically significant and large compared to shocks to borrowers' demand for credit; or
- movements in money and credit indicate changing perceptions of the future path of wealth or income that will affect spending; or
- inflation and demand are not measured with perfect accuracy, so that the pragmatic approach would be to look at everything available.

Goodhart presents a number of reasons to believe that these conditions are satisfied in practice. The current volatility of credit markets worldwide, induced by a degree of uncertainty about the health of financial institutions in the large developed economies, would be a prime example

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<sup>9</sup> See, for example, Borio (2006), BIS (2007), and Mishkin (2007). The literature in this area is very large, and this article is intended to offer an introduction only.

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of the kind of credit supply shock Goodhart might have in mind.

Goodhart argues that central banks should pay more attention to developments in money and (particularly) credit in the process of monetary policy formulation. Among other things, he asserts that monitoring money and credit may help policymakers interpret asset market developments and draw implications from them for the economic and financial outlook (eg, whether strong asset price movements are more likely to be due to 'fundamentals' or due to 'bubble' behaviour).<sup>10</sup> This would reduce the risk that an inflation-targeting strategy focused on the outlook for CPI inflation fails to take due account of signals from the asset markets, given that asset prices do not typically feature with much, if any, weight in CPI measures of inflation.

On the other hand, another eminent expert on monetary policy, Michael Woodford, has written strong defences of the low-key approach to money (specifically) in monetary policy. Woodford (2007a) is a good example.<sup>11</sup> Essentially, Woodford argues that the risks for inflation of not paying enough attention to money are overstated. He builds his argument using the current 'workhorse' approach to the inflation control problem commonly employed in central bank models in regular use for forecasting, and in theoretical macroeconomics. The workhorse involves three core equations:

- (1) economic activity as a function of the short-term interest rate;
- (2) inflation as a function of economic activity and inflation expectations (ie the 'expectations-augmented Phillips Curve'); and
- (3) interest rates as a function of future inflation relative to the central bank's inflation target and economic activity (which captures the behaviour of monetary policy).

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<sup>10</sup> Along these lines, Borio and Lowe (2004) set out an approach for combining assessments of credit market conditions and asset market conditions into indicators of banking system stress.

<sup>11</sup> Woodford (1998) is also useful. A sympathetic view is offered by McCallum (2001). Woodford (2007b) looks critically at the ECB's two-pillar approach in particular.

The workhorse approach does not include an explicit role for money. Woodford's (2007) view is that it is largely sufficient for the understanding of inflation. In this view, money is seen as mostly incidental to economic activity, fluctuating passively according to the funding needs of the economy. Monetary policy can be adequately conducted and inflation controlled without worrying much about money and credit – even if there is a stable long-run relationship between money and prices, as predicted by the Quantity Theory.

## 4 An updated look at the New Zealand data

An updated look at the basic facts in the New Zealand data relating to money and credit, and their indicator value for other economic variables of interest, suggests support overall both for Charles Goodhart's advocacy of paying more attention to measures of credit, and for Michael Woodford's scepticism about the information value in money measures, in New Zealand.

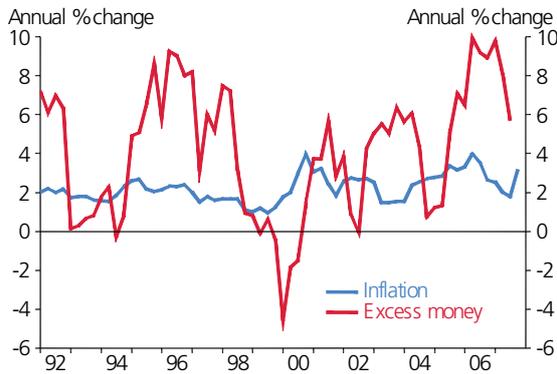
### 'Excess money' and inflation

Taking Woodford's arguments first, and thinking along 'monetarist' lines: if the Quantity Theory is correct and velocity is constant, there should be at least a long-run relationship between 'excess money growth' – defined as the growth of the ratio of money to real GDP – and inflation. There is little evidence of such a relationship between inflation and 'excess' growth in M1, M2, total M3 or resident M3. This contrasts with several recent studies of the euro area (eg Nicoletti Altimari, 2001; Gerlach and Svensson, 2003).

Figure 1 shows excess growth in resident M3, the excess money growth measure that in our investigations correlated best with headline CPI inflation. It is evident that not only is the correlation weak and the ratio of the growth rates rather different to the Quantity Theory's prediction of one, but the lead-lag relationship is unclear. In some periods, inflation appears to lead excess money. On their face, the New Zealand money data would appear not to offer much predictive value for inflation, even in the long run.

Figure 1

Excess money growth and inflation<sup>12</sup>

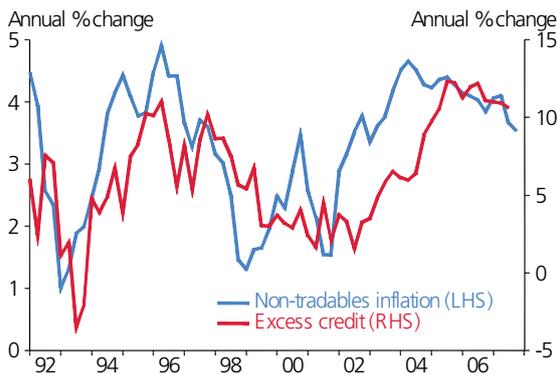


Sources: Statistics NZ, RBNZ.

Figure 2 replaces 'excess money' with 'excess credit'. Goodhart argues that system-wide credit measures should better capture the stock of funding available to the economy when, as in New Zealand, banks have a diverse range of funding sources other than New Zealand dollar deposits. In figure 2, we also replace headline inflation with non-tradables inflation, as non-tradables inflation should smooth out 'non-monetary' factors such as oil price shocks and short-term exchange rate volatility. Statistically, excess credit and

Figure 2

Excess credit growth and non-tradables inflation<sup>13</sup>



Sources: Statistics NZ, RBNZ.

<sup>12</sup> Excess money growth is defined as the annual percent change in the ratio of resident M3 to real production GDP, which is an exact rearrangement of the Quantity Theory in growth-rate terms. The growth rate of money minus the growth of real production GDP is an approximation to this measure.

<sup>13</sup> The credit measure is private sector credit excluding repurchase agreements between banks - ie a measure of the credit available to the 'real' economy, as opposed to the financial sector.

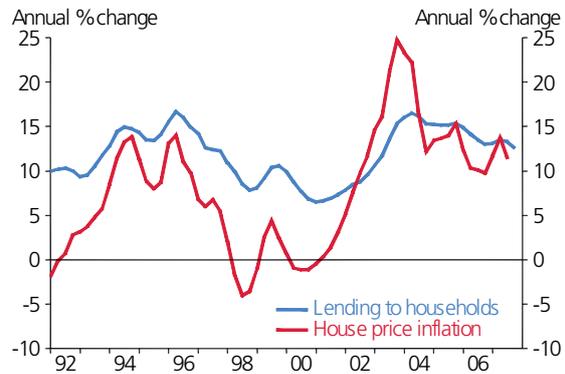
non-tradables inflation appear to correlate more closely than excess money and headline inflation, and a common cycle across the two series is evident. In this figure, in contrast with figure 1, we have plotted the series on different axes, to show the relationship in the best light – and it still cannot be said that the relationship is especially tight or consistent.

Money and credit measures as leading indicators

Figure 3 shows one of the better-performing near-term leading-indicator relationships we use, that between housing credit and house prices. Again, the relationship is not particularly tight. Generally, housing credit growth has been more stable than house price inflation. Also, it is evident that the mean level of house price inflation rose substantially around 2000, whereas the growth rate of housing credit stayed roughly the same. The turning points in the respective cycles are roughly coincident, but the earlier release of the housing credit data provides an effective lead of a few weeks for forecasting purposes.

Figure 3

Housing credit growth and house price inflation



Sources: Statistics NZ, Quotable Value NZ.

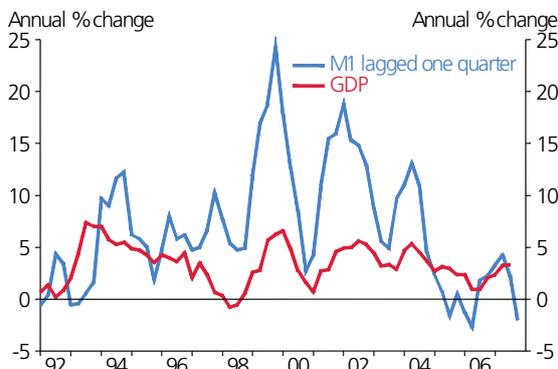
We also tested a range of other candidates for leading indicator relationships, with varying degrees of success. Razzak's (2001) result of a weak leading relationship between growth in M1 and real GDP growth was confirmed (Figure 4).<sup>14</sup> However, the tightness of this relationship falls well short of the accuracy we are able to achieve with our

<sup>14</sup> The Quantity Theory would suggest that nominal GDP growth should be better explained by M1 than real GDP growth, but our testing found the opposite.

current approach of looking at a wide range of indicators for near-term GDP forecasting.

**Figure 4**

**M1 growth and real GDP growth**



Sources: Statistics NZ, RBNZ.

Though the system-wide aggregates might not be as useful as other data for quantitative forecasting, this does not necessarily mean that they provide no information at all. As suggested in the M1 and excess credit graphs, there appears to be some correspondence between the broad swings and low-frequency turning points in the aggregates and the broad macro variables. Research in other countries on characterising these low-frequency correlations continues, but shows mixed results. Most US studies find that M1 is not very useful for predicting future GDP growth, but several studies of the euro area countries have been more positive (eg Brand *et al.*, 2003). These other studies employ more sophisticated equation specifications than those in the results reported here, including the inclusion of interest rate terms.

#### 4 Future directions for research on the use of money and credit measures

The Reserve Bank continues to look at how the scope and coverage of the Reserve Bank's money and credit statistics might be improved. Rochelle Barrow's article in this edition of the *Bulletin*, "Future directions for the Reserve Bank's financial statistics", discusses this topic in the context of our broader financial statistics collection activities.

Our analytical development and exploration of the use of money and credit measures is focused on the indicator properties of the credit statistics in particular. Also, the role of credit market frictions, financial imbalances and balance sheets in business cycle dynamics continues to feature on our research programme, like that of others (eg, Borio and Lowe, 2004; Borio, 2006). This reflects the growing interest in the central banking community in better characterising the relationship between financial stability objectives and price stability objectives, including the role of policy. This research programme too is focused mostly on credit dynamics and measures.

The broad idea traced by Charles Goodhart, the ECB and the Bank of Japan is that money and credit analysis may enable central banks to assess longer-term risks to price stability, including emerging financial imbalances, large asset price cycles, or other threats to financial stability. If this idea has merit, an issue would be how to formalise this analysis and integrate it systematically into central banks' modelling and forecasting strategies. In other words, what would be the best way to expand the 'workhorse' macro framework to include money and credit dynamics? Issing (2006) suggests that the ECB's 'monetary analysis' pillar is not an unreasonable approach, but as discussed above, this view is not uncontested.

As noted above, the theoretical literature on this topic is growing. The thought process regarding the information value in money and credit measures in upswings may not be identical to that in downswings. During upswings, if asset prices are rising rapidly, money and credit developments might shed light on the role of unanchored price expectations in explaining asset price movements, relative to the role of measurable fundamentals. During downswings, the risk of financial system disruption such as financial institution failures or sharp changes in portfolio preferences will be more relevant.

Though the New Zealand data does not show an evident lead in the turning points from money and credit to growth and inflation, this does not mean that there is no 'financial accelerator' in practice. Nor does it mean that money and credit supply do not play an important role in propagating or amplifying economic disturbances. The observed lead

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from activity and inflation to money and credit may indicate simply that 'real' sector shocks tend to be larger or more frequent than financial sector disturbances as a source of macroeconomic fluctuations.

This tendency need not hold all the time, as current circumstances suggest. Credit market frictions are clearly a pertinent feature of the economic outlook around the world right now, and present a challenging monetary policy problem. At the very least, there are communication issues in explaining how a relatively distant inflation threat related to credit or asset market developments might be influencing monetary policy, when medium-term inflation pressure appears to be either broadly consistent with price stability, or indeed possibly pushing in the opposite direction.<sup>15</sup> New Zealand's present circumstances, with a rising domestic cost of credit reflecting the largely offshore credit market problems, also show that a generally solvent, well-developed and competitive financial system such as ours does not always insulate the economy from material credit supply dynamics.

## 5 Conclusions

Ongoing financial globalisation and liberalisation may mean that distant threats to price stability from money and credit market behaviour may be becoming a more frequent and immediate policy concern. The arguments of Charles Goodhart in favour of paying more attention to credit measures, and those of Michael Woodford against looking too much at money, in the conduct of monetary policy are generally supported, or at least not refuted, by the New Zealand data. To a large extent, the Reserve Bank's current practices in using money and credit measures is consistent with both the Goodhart and the Woodford positions. More work is needed on understanding money and credit dynamics and how they interact with asset markets, and the real economy.

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<sup>15</sup> Borio (2006) and Reynard (2007) discuss in general terms the communication issues associated with near-term vs. distant inflation threats.

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