

**A Comment on Fischer, Lenza, Pill, and Reichlin's  
"Money and Monetary Policy: the ECB Experience 1999-2006"**

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The paper by Fischer et al. provides a useful description of the tools and procedures used by the ECB as part of its monetary analysis, and how they have evolved over time. That analysis has, according to the ECB's strategy, a key role in assessing the outlook for price developments over the medium to longer term. It is also supposed to constitute an important input in its decision-making process, complementing the so-called economic analysis (which focuses more directly on measures of economic activity, prices and costs). Of course, the authors are better placed than anyone else to provide a descriptive account of the monetary analysis conducted at the ECB. The outcome of that exercise is a useful paper that should be welcome by all ECB watchers (I use the latter term in a broad sense) and a must-read for anyone interested in the workings of the monetary pillar in practice.

But the authors do not restrict themselves to a descriptive account. They also seek to provide, in their words, "a thorough ex-post evaluation of the information content and policy relevance of the monetary analysis," using a real-time data set constructed with that objective. In other words, the paper seeks to answer the following two questions: Has the monetary policy analysis been useful, in particular, in assessing the outlook for inflation? And, to what extent have Governing Council (GC) policy decisions been influenced by the monetary policy analysis? While, by their very nature, there cannot be a straightforward answer to the previous questions, the paper offers many insights that help the reader form a clear overall picture.

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The paper touches upon a large number of issues, all of interest. My brief comments will focus on two of them. First, I will discuss the paper's account of the evolution of monetary analysis at the ECB, and the role that the stability of empirical money demand equations may have played in shaping that evolution. Secondly, I will offer a critical assessment of the reduced-form money-based inflation forecasts that appear to have become a centre-piece of the ECB's monetary analysis, and point to some shortcomings of the quantitative evaluation of those forecasts found in the paper.

### **The Evolution of Monetary Analysis at the ECB: the Role of Money Demand Equations**

Fischer et al. offer a detailed description of the use and performance of money demand equations as part of the ECB's monetary analysis. Their account reveals a dramatic change in their status over time.

It is worth recalling here that, at the onset of EMU, the ECB viewed the existence of a stable money demand as a key condition for justifying the prominent role of money and the reference value for M3 growth established in the monetary policy strategy made public by the Governing Council in 1998. In explaining that strategy and its underpinnings, the ECB emphasized the strong evidence in support of such a stable money demand. Here is an illustration:

*"The available empirical evidence suggests that broad monetary aggregates exhibit the properties required for the announcement of a reference value...In the past the demand for euro area broad money has been stable over the long run...[that] empirical evidence has been judged strong and robust enough for a reference value to be announced..."*<sup>2</sup>

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<sup>2</sup> ECB (1999)

At that time, many academic observers were much less sanguine about the prospects of a stable money demand for the euro area.<sup>3</sup> The search for a stable money demand relationship had proved elusive for many other countries. In the U.S., for instance, the observed instability of empirical money demand equations was interpreted as a natural consequence of financial innovation and changes in the patterns of liquidity management by households and firms. The likely though uncertain changes in behavior associated with the switch to a new policy regime in the euro area, it would seem, could only make matters worse.

Four years later, at the time of the self-evaluation of its strategy, the ECB largely re-affirmed the usefulness of existing money demand models, noticing however that those models were not able to explain the acceleration of M3 since mid-2001. The ECB also made clear that its monetary analysis had been extended beyond the assessment of M3 growth relative to its reference value, to include “*a comprehensive assessment of the liquidity situation based on information from the components and counterparts of M3,...and from various money gap measures and concepts of excess liquidity.*” That analysis “*...[should] be helpful for extracting a signal for monetary developments that is relevant for identifying the longer-run trend in inflation.*”<sup>4</sup>

As the account in Fischer et al. makes clear, the ECB’s initial hopes regarding the stability of money demand were not realized. The paper refers to as many as four different money demand models that have been used at different times as part of the ECB monetary analysis. Two of those models appear to have been discarded. The remaining two have been subject to numerous ad-hoc modifications, in order to improve their fit. As a result of that failure, the focus shifted gradually to the construction of “adjusted M3 measures,” that sought to remove components that reflected shifts in money demand that would not be deemed a risk to price stability. In addition, and in order to supplement the reference value for M3 growth, a number of alternative monetary indicators started being used, including *money gap* measures.

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<sup>3</sup> See, e.g., Svensson (1999).

<sup>4</sup> ECB (2003)

The previous developments have represented a significant shift in the ECB's thinking on the importance of money demand stability as a foundation of the monetary pillar. In the words of Fischer et al.

"...money demand is no longer seen as the centre-piece of the framework for monetary policy analysis. Conducting a rich monetary analysis is thus not contingent on the stability or otherwise of any single specification of money demand for a particular monetary aggregate..."

That re-assessment, following the empirical failure of existing money demand models and the tools (e.g. excess liquidity measures) that relied on the stability of such models, has led to a growing emphasis on instruments that—at least apparently—do not hinge on the stability of money demand, and most prominently, reduced form, money-based forecasts of inflation.

But, in my opinion, the ECB's emphasis on the importance of a stable money demand was misguided from the beginning. The value of monitoring monetary aggregates or measures of excess liquidity as part of an assessment of the risks to price stability is questionable, *even in the presence of a stable money demand*.

In order to illustrate the previous point let me offer a simple example. For simplicity I normalize target inflation,  $\pi^*$ , and trend output growth,  $\Delta y_t^*$ , to zero. Assume that actual inflation is proportional to the log deviation between output,  $y_t$ , and its natural level,  $y_t^n$ :

$$\pi_t = \lambda (y_t - y_t^n)$$

The following stable money demand relationship is assumed to hold

$$m_t - p_t = \beta y_t$$

Note that, for simplicity, the demand for real balances is assumed to be independent of the interest rate, though that assumption is not critical for the argument below. Combined with the assumptions on target inflation and trend output growth, it is easy to check that the previous money demand schedule implies a reference value for money growth—as constructed by the ECB—equal to zero.

Note actual money growth is given by

$$\Delta m_t \approx \pi_t + \beta \Delta y_t \quad (1)$$

On the other hand, the measure of the real money gap, as constructed by the ECB is given by

$$\begin{aligned} RMG_t &= (m_t - p_t) - \beta y^* \\ &= \beta (y_t - y^*) \end{aligned} \quad (2)$$

Consider next the following hypothetical (but perfectly plausible) scenario. Suppose that the economy experiences a productivity boom, reflected in a persistent increase in the growth rate of natural output,  $\Delta y_t^n$ . Moreover, let us assume that the central bank succeeds in stabilizing inflation, by generating, through appropriate interest rate adjustments, an increase in output commensurate to the increase in the natural level. From (1) we see that money growth will show a persistent deviation from its reference value. That deviation would, however, be totally uninformative about future inflationary pressures, since inflation remains unchanged all along. Furthermore, the real money gap would show a permanent (and potentially large) increase, even though no rise in inflation would follow.

Alternatively, suppose that the central bank chooses to accommodate only gradually the increase in potential output, thus triggering a persistent deflationary episode. In that case, and as long  $\lambda$  is sufficiently small, we would observe a positive deviation of money

growth from its reference value as well as a persistent increase in the real money gap. According to the ECB, those indicators should signal risks of inflation. But in our illustrative example they are followed by... deflation!. Furthermore, if the monetary signals were taken at face value, the central bank could be misled into pursuing a policy that would only reinforce the existing deflationary pressures.

The previous example is meant to illustrate a more general proposition: the existence of a stable money demand relationship does not necessarily make monetary indicators useful in assessing the outlook for inflation and, hence, as guidelines for policy. In the example above, forecasting inflation must necessarily involve a forecast of the evolution of output relative to its natural level. It is hard to envision a scenario in which monetary aggregates could prove useful in that regard.

So, after all, perhaps we should welcome the fact that money demand in the euro area has turned out to be highly unstable, and that this has been recognized by the ECB. Once the mirage of a stable money demand equation is gone, it is more likely that concepts like the reference value for M3 growth or measures of excess liquidity like the “real money gap” will be substantially downgraded or maybe even eliminated from the ECB’s toolkit.

### **Reduced Form Money-Based Inflation Forecasts**

So what is the role left for monetary aggregates in that context? Fischer et al. point to a newfound role for monetary aggregates in the analysis of the ECB: as an explanatory variables in real-time, OLS based, reduced form forecasting equations.

Fischer et al. evaluate the out-of-sample performance of real time money-based inflation forecasts relative to a number of alternative forecasts. While the authors emphasize that it may be too early to draw definite conclusions from their exercise, the intended message

seems clear: monetary aggregates seem to contain information about future inflation that is potentially relevant for monetary policy decisions.

How useful can these reduced-form money-based inflation forecasts be? Let me start with an observation. The authors present a range of indicators to evaluate the out-of-sample performance of the inflation forecasts based on the adjusted money series, and offer a favorable assessment of that performance. But, against convention, they do not present a graph plotting their forecast along the variable being forecast. Figure 1 displays such a graph. To go to the point: while the money-based forecast happens to get the mean more or less right, it fails miserably at tracking the movements in average 6-quarter ahead inflation: the correlation between the forecast and the realization is slightly negative!<sup>5</sup>

A possible response to that observation could run as follows: money-based forecasts are not intended to anticipate small fluctuations in inflation around a constant mean, but instead persistent (even permanent) changes in that mean. Since we did not observe such an episode over the past six years, the fact that the forecast has remained close to the realized mean is good news. But given that evidence (or lack thereof), how should the ECB respond to an eventual persistent change in the mean of the forecast? This is not a hypothetical scenario: A rise in the money-based forecast of inflation has accompanied the accelerating trend in M3 growth over the past few years, which may have led to calls for higher interest rates.

I would like to argue that putting much weight on such forecasts may not be warranted, and taking them seriously as an input for monetary policy decisions might be dangerous. To help me convey my argument, let me present my own estimates of a simple version of the bivariate forecasting equation for 6-quarter ahead used in the paper, covering the period 1980:I-2004:IV and using the corrected M3 growth measure:

$$\pi_{t,t+6} = \underset{(0.26)}{-0.25} + \underset{(0.05)}{0.52}^{**} \pi_t + \underset{(0.05)}{0.22}^{**} \Delta m_t + \varepsilon_t$$

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<sup>5</sup> Similar results obtain for the 12-quarter ahead forecasts, not shown here.

Thus, we see that money growth is statistically significant, i.e. it has predictive power for future inflation, a property that could in principle be exploited in assessing the risks to price stability. Of course, other variables can also be shown to be significant, but that is not the issue, since the ECB does not deny the usefulness of other variables. In fact , money growth appears to be significant even after one controls for some other variables.

What are the problems with forecasting equations of this sort, and their potential use as an input to monetary policy? The first problem is related to the Lucas critique: reduced form forecasting equations involving inflation and money growth do not represent a structural relationship. As a result their coefficients are likely to vary over time as a result of structural changes in the economy, including changes in the monetary policy regime or as a result of the very instability of money demand equations reported by Fischer et al. Thus, money may have predictive power for inflation over a certain period, but may lose it after a while.

This is precisely what may have occurred in the euro area. The significance of adjusted M3 growth in bivariate inflation forecasting equations seems to emanate from similar (though slightly phased-out) low frequency movements in those two variables during the 80's, clearly identifiable in Figure 2. Such a low frequency comovement seems have been absent for the past 15 years. This suggests some instability in the dynamic relationship between inflation and adjusted M3 growth. That instability is reflected in the estimates of the above forecasting equation using data starting in 1998:I:

$$\pi_{t,t+6} = 1.22^{**} + 0.26^{**} \pi_t + 0.07 \Delta m_t + \varepsilon_t$$

(0.47)                      (0.11)                      (0.08)

That instability is also captured by rolling estimates of the coefficient of adjusted money growth in the above regression, as shown in Figure 3.<sup>6</sup>

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<sup>6</sup> Similar results emerge for unadjusted M3 growth.



A different perspective on the same issue can be given by looking at the evidence outside the euro area. If the ability of monetary aggregates to predict future inflation is an inherent feature of market economies (or at least of those with a level of development similar to the euro area), one should also find evidence of that predictive power for other countries. Yet, estimates of the baseline bivariate forecasting equation using U.S. data (covering the 1980:I-2004:IV period) show no evidence of predictive power of M3 growth for 6-quarter ahead inflation, as the following estimated equation makes clear.

$$\pi_{t,t+6} = \underset{(0.23)}{2.67}^{**} + \underset{(0.04)}{0.20}^{**} \pi_t - \underset{(0.03)}{0.03} \Delta m_t + \varepsilon_t$$

Given that *prima facie* disconnect between monetary aggregates and inflation, it is not surprising that the Federal Reserve has abandoned the use of monetary aggregates as a reference for their policy decisions.

### **Concluding Remarks**

From the outset of EMU, a vast majority of academic economists have expressed their skepticism about the two-pillar structure of the ECB monetary policy strategy and, more specifically, about the usefulness of the monetary pillar.<sup>7</sup> That skepticism has been based on lessons drawn from modern monetary theory and the experience of other countries, rather than the actual workings or the practical implications of that ECB's monetary pillar. In fact, until now, little was known of the latter.

Fischer et al. have written a paper that sheds some needed light on the workings of the monetary pillar in practice. The paper brings together a wealth of information that was either dispersed or not public until now, and the ECB has to be commended for this additional step towards greater transparency. Many economists will find that information useful. But very little of it can be used in my opinion to change the minds of the critics.

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<sup>7</sup> See, e.g., Svensson (1999) and Galí (2003).

On the contrary, the paper brings to the fore some of the strains that the implementation of the monetary pillar has generated.

Let me conclude with a prediction which, of course, is only modal: Ten years from now the current two pillar strategy of the ECB will have been revamped, and the so-called monetary analysis will have been “integrated” into the more general economic analysis. If that is the case, I conjecture that the paper by Fischer et al., and the reflections and discussions that it must have triggered within the ECB, will be seen as a significant mark on the road towards a more coherent and easier-to-communicate monetary policy strategy for the euro area.

## References

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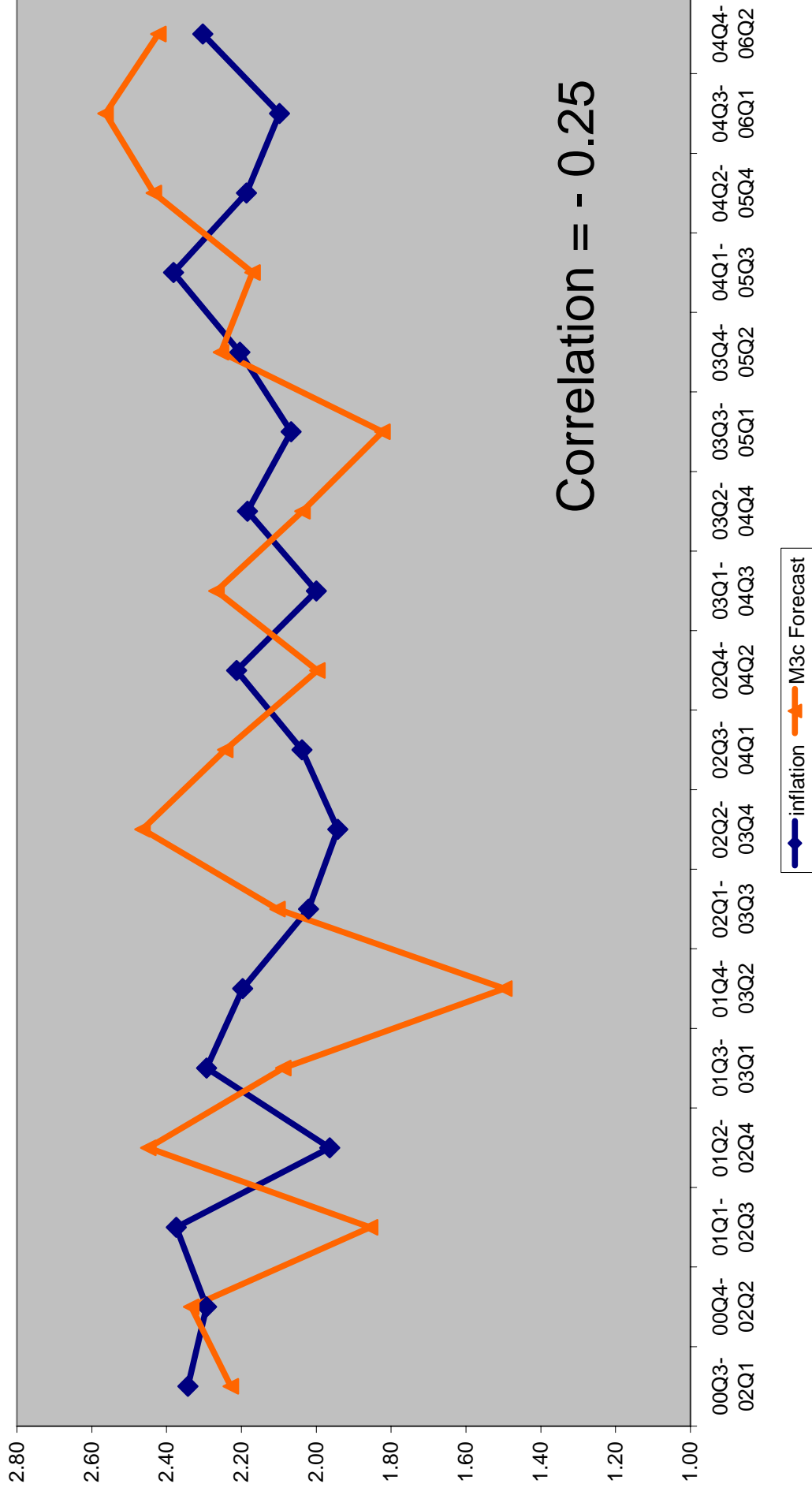
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Figure 1

# Real-Time Money-based Inflation Forecasts: 6 Quarter Horizon



Correlation = - 0.25

Figure 2

## Euro Area Inflation and M3c Growth

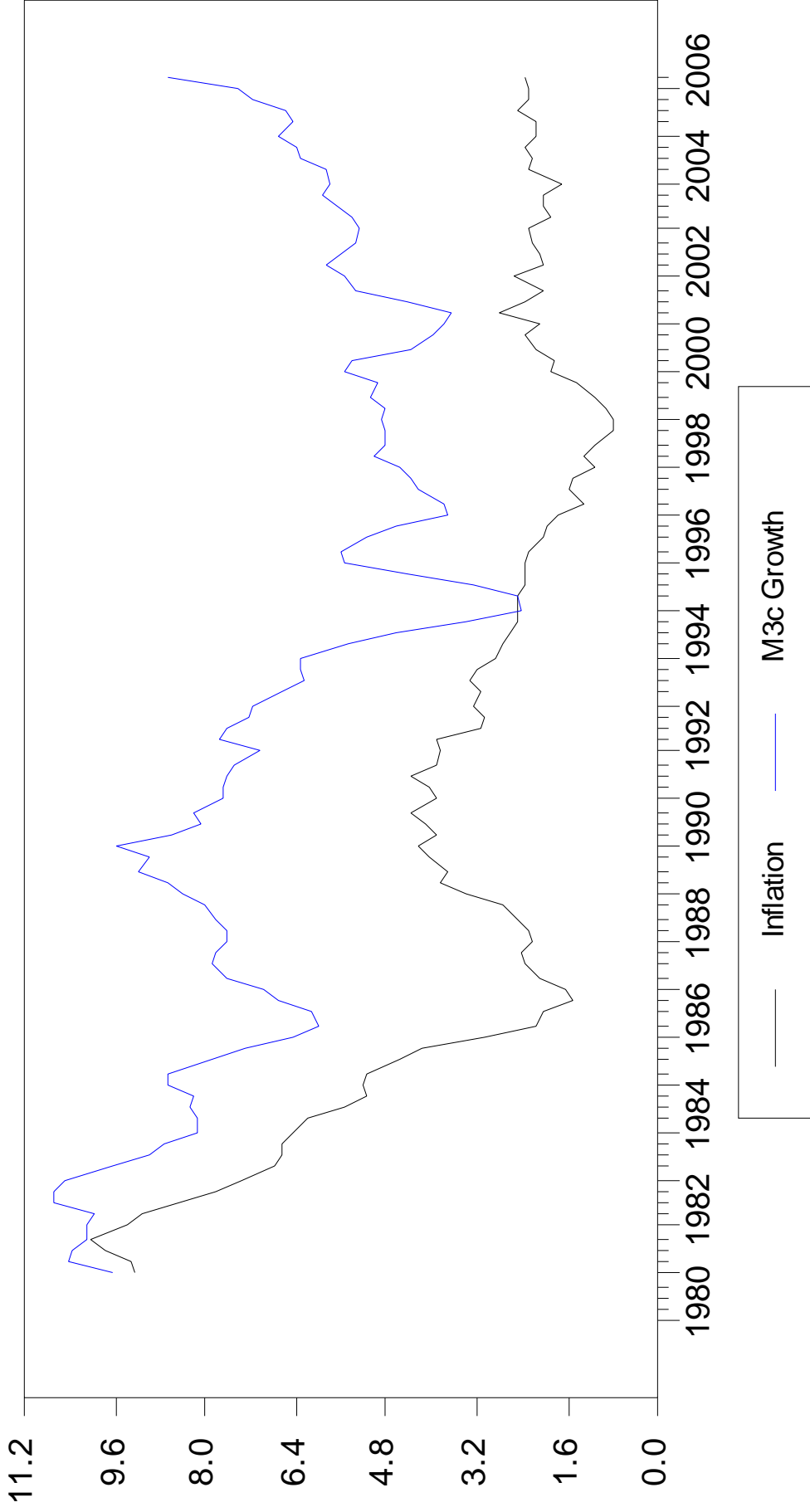


Figure 3

# Recursive estimates of M3c Growth

*Using a moving window of width 24*

