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Inflation monitoring in real time: A comparative analysis of the Federal Reserve and the Bank of England☆

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ABSTRACT

This paper extends the asymmetric preference model suggested by Ruge-Murcia (2003a) to investigate the use of real-time data which roughly measure the type of data available to policy makers when making their decisions and revised data which more accurately measure economic performance (Croushore, 2011). In our extended model, the central banker monitors a weighted average of revised and real-time inflation. Moreover, we allow for an asymmetric central bank focus on real-time inflation depending on whether the unemployment rate is high or low. Our model identifies a source of inflation bias due to inflation revisions. Our empirical results suggest that the Federal Reserve Bank focuses on monitoring revised inflation during low unemployment periods, but it weights real-time inflation heavily during high unemployment periods. In contrast, the Bank of England seems to focus on an equally-weighted average of real-time and revised inflation when monitoring inflation which is fairly robust over the business cycle.

1. Introduction

Monetary policy may reflect the impact of real-time data, which roughly measure the type of data available to central bankers at the time when their decisions are made, as well as revised data which more accurately measure economic performance.[1] First announcements of many macroeconomic variables—e.g. the rate of inflation and GDP—for a given quarter are released around the middle of the following quarter, well before the final release, which takes place roughly 3 years after the first announcement. Due to these long lags, central bankers face an important conflict. Ideally, they might aim to influence the performance of the actual economy based on optimal

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[1] The impact of the revision process on the empirical evaluation of monetary policy has been widely investigated in the literature—see Croushore (2011) and references therein. A pioneering article by Maravall and Pierce (1986) investigates how preliminary and incomplete data affect monetary policy. They show that even if revisions to measures of money supply are large, monetary policy will not be much different if more accurate data are known whenever policymakers are able to optimally extract the signal from the data. More recently, Orphanides (2001), among others, shows that real-time measurement problems of conceptual variables, such as output gap, may induce policymaking errors. Croushore and Evans (2006) show evidence that the use of a VAR based on revised data may not be a serious limitation for recursive identification of monetary policy shocks. Nevertheless, their analysis also shows that many simultaneous VAR systems identifiable when real-time data issues are ignored cannot be completely identified when these measures are considered. All these studies consider US real-time data. More recently, Fernandez, Koening and Nikolsko-Rzhevskyy (2011) assemble a real-time data set for the OECD countries. In line with the US data revision features reported below, they find that statistical agencies from OECD countries tend to underestimate both real output growth and inflation.

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forecasts, but because of the long lags associated with the revised data that most accurately measure this performance their actual forecasts might be affected by the most readily available data arriving in real time; this is because market participants' evaluations of monetary policy performance, and by the same token central bank inflation monitoring, are likely to be based at least partially on real-time data components, which do not help to forecast optimally revised data. As noted by Croushore (2011), if the discrepancy between real-time and revised data were characterized by a pure news component—as opposed to a noise component—then the lags associated with data revisions would not be an issue because real-time data would be an optimal forecast of revised data. However, this is not the case because revisions usually incorporate both news and noise components (see Aruoba (2008) and references therein), which means that there is some predictability in these data revisions. Moreover, it is extremely difficult, if not impossible, to distinguish the news and noise components of expected revisions in real time in an always changing economic environment. All these features may induce policy-makers to make decisions that deviate from decisions that simply reflect revised data.

Our paper contributes to the large body of theoretical literature which investigates the possibility that central bankers may induce an upward bias in inflation. Barro and Gordon (1983) suggest that central bankers might be unable to make long-term policy commitments, which might lead them to pursue policies which create surprise inflation. This proposition generated considerable interest with numerous empirical papers (e.g. Ireland, 1999) showing mixed results. More recently, Ruge-Murcia (2003a, 2003b, 2004) develop a new theory suggesting that a central banker featuring asymmetric preferences might induce an inflation bias.[2] In the model of Ruge-Murcia (2003a, 2004), the inflation bias arises because the monetary authority takes stronger action when unemployment is above the natural rate than when it is below the natural rate. A similar finding is shown by Cassou, Scott, and Vázquez (2012), who posit an asymmetric preference model which focuses on an output asymmetry rather than an unemployment asymmetry. In their model the inflation bias arises because the central banker takes stronger action when output is below its permanent level than when it is above. None of these papers find support for the surprise inflation hypothesis à la Barro and Gordon, but they provide strong evidence in favor of the asymmetric preference hypothesis suggested by Ruge-Murcia (2003a).

We extend the model by Ruge-Murcia (2003a, 2004) by assuming that the monetary authority wants to monitor a weighted average of both revised and real-time inflation forecasts. As motivated above, the inclusion of real-time inflation in the formulation of a central banker objective function is due to the long lag in the releases of final inflation revisions, which might result in a central banker paying attention to real-time inflation forecasts even if they are not rational forecasts of revised inflation. This hypothesis of central bank monitoring of real-time inflation may also reflect the inability of a central banker to make long-term policy commitments as in Barro and Gordon (1983), but the inability studied in this paper is due to a different issue. In particular, here a central banker might be forced to focus on real-time inflation forecasts as a result of short-term pressures from other policy makers, economic pundits or public opinion.[3] Moreover, we explore the hypothesis that the relative importance of real-time inflation forecasts in central bankers' decision-making may be greater during high unemployment periods due to political pressures to react quickly to bad news. Thus, political pressures can also induce asymmetric central bank responses to inflation in real-time decision making. As a result, the importance of an inflation bias induced from the differences between revised and real-time inflation data, as in the traditional inflation bias sources suggested by Barro-Gordon (1983) and Ruge-Murcia (2003a, 2004), is likely to be a consequence of the degree of central bank independence, which can differ from country to country.

By following Ruge-Murcia (2003a, 2004) we are considering a targeting rule approach (e.g. Clarida, Galí, & Gertler, 1999; and; Svensson, 1999) by first defining a central bank's loss function whose arguments are the monetary policy targets, where these targets in our extended framework can be affected by real-time issues due to the long lags associated with the releases of revised data. This is in contrast with the instrument rule approach (McCallum & Nelson, 2005) usually followed in the related literature to analyze the importance of real-time data (e.g. Orphanides, 2001).[4] The targeting rule and the instrument rule approaches can be viewed as two alternative ways (each with its pros and cons) of dealing with real-time issues. In this perspective, the targeting rule approach adopted in this paper is suitable for identifying potential sources of inflation bias (i.e. those induced by asymmetric central bank preferences à la Ruge-Murcia and those induced by data revisions) in a rather simple framework.

Our model with inflation data revisions identifies a potential source of inflation bias that arises due to two features as suggested in Cassou, Scott, and Vázquez (2016): First, the lag of revised inflation measurements with respect to their initial announcements, which may explain why a central banker may pay attention to real-time inflation; and second, the asymmetric central bank focus on real-time inflation may differ depending on whether the economy is doing well or not. The approach followed in this paper is fairly close to the one followed in Cassou et al. (2016) with a few important differences. We focus on the asymmetric preference model of Ruge-Murcia (2003a, 2004) based on asymmetric preferences on unemployment instead of the asymmetric preference model based on asymmetric preferences on output suggested in Cassou et al. (2012). As explained below, this strategy enables us to better identify the source of bias due to inflation revisions by using a maximum likelihood approach instead of an instrumental variable approach as used in Cassou et al. (2016). In addition, we extend our analysis to investigate UK data as well as the US data studied in their paper. This enables us to make a comparison between the ways in which the Federal Reserve and the Bank of England deal with non-trivial inflation revisions in the characterization of monetary policy.

Our empirical results clearly show that both the Federal Reserve and the Bank of England take into account real-time inflation

[2] Early papers putting forward central banker asymmetric preferences are Cukierman (2002) and Nobay and Peel (2003). Another approach followed by Surico (2007) focuses on monetary policy rule asymmetries.

[3] That is, the central banker may be more worried about the policy evaluation based on real-time data made in the near future than the one based on revised data, which can be implemented when these data become available only after a long delay.

[4] As emphasized below, an attractive feature of Ruge-Murcia's formulation is that the policy instrument is left unspecified. Hence, the optimal inflation rate is robust to alternative operating procedures and instrument rules used by central bankers, which avoids a potential source of misspecification.