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Inflation expectations: Does the market beat econometric forecasts?

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ABSTRACT

The present paper compares expected inflation to (econometric) inflation forecasts based on a number of forecasting techniques from the literature using a panel of ten industrialized countries during the period from 1988 to 2007. To capture expected inflation, we develop a recursive filtering algorithm that extracts unexpected inflation from real interest rate data, even in the presence of diverse risks and a potential Mundell–Tobin-effect.

The extracted unexpected inflation is compared to the forecasting errors of ten econometric forecasts. In addition to the standard AR(p) and ARMA(1,1) models, which are known to have the best performance on average, we also employ several Phillips curve-based approaches, VAR, dynamic factor models and two simple model averaging approaches.

Finally, we show that the quality of the expectations clearly matches the quality of the forecasts derived with the techniques that are currently proposed for this purpose in the economic literature.

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1. Introduction

There are few phenomena where expectations have played a prominent role in economic debate for long as has been the case for inflation. The importance of the role of the expected inflation for the choice of a growth-enhancing monetary policy has been an essential problem of monetary economics since the emergence of the dispute between the Keynesian and Monetarist schools of thought in

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the 1960s. The rationality of expectation formation in general has often been questioned, especially because of observations made in the highly volatile financial markets.

However, the results presented in this paper show that the quality of the inflation expectations matches the quality of the best available econometric forecasting techniques that are commonly employed to forecast inflation.

For this purpose, we compare unexpected inflation, which is estimated with a recursive filter mechanism based on real interest rate data, with the forecast errors of ten different econometric inflation forecasts. The data cover ten OECD countries for the period from 1980 to 2007, allowing for the comparison of (reasonably precise) forecasts from 1988 to 2007.

Other than the development of the filtering algorithm, the main contribution of this paper to the literature is the comparison of expectations and forecasts that is made possible by this technique. Previous papers on this issue usually had to rely on survey data. However, the expected inflation that is manifested in the market results is unlikely to be an unweighted average of individual expectations. If labor, money and commodity markets are working, then reasonably formed expectations of well-informed agents should dominate the results. Survey data do not reflect the heavy weight of some agents, resulting in a distorted picture of aggregate expectations.

The remainder of this paper is structured as follows. Section 2 discusses the relevant literature. In Section 3, we develop the filtering mechanism that is used to extract unexpected inflation and present the forecasting techniques used. In Section 4, the employed data is presented. Finally, Section 5 presents the results and their interpretation. Section 6 concludes the paper.

2. Expected inflation, inflation forecasts and the real interest rate

The formation of inflation expectations, which in turn affect real values, plays a substantial role, particularly in the theoretical literature. There is a broad body of literature on information and learning as applied to this issue.¹ The obvious problem when tackling these issues empirically is to measure expected and unexpected inflation. Nevertheless, there is a rich body of literature on this topic that is based on survey data. In the United States in particular, several surveys, which focus partially on experts (Livingston, ASA-NBER-Survey of Professional Forecasters) and partially on private households (Michigan Survey), have been performed annually for several decades. There is a large body of literature comparing household surveys to expert surveys. As experts are heavily influenced by econometric inflation forecasts made by these experts and other experts, this body of literature is closely related to this paper.

An early comparison of survey results can already be found in Gramlich (1983), who finds that randomly selected households outperform experts. However, he finds substantially distorted expectations of households and experts and concludes that expectation formation is an irrational process. Bryan and Gavin (1986) show that this alleged bias of private households is caused by a misspecification of Gramlich's econometric model and that, surprisingly, only the biased expectations of experts persist in an improved version of the model.²

Similarly, Rich (1989) who accounts for the heteroscedasticity of inflation cannot reject the hypothesis of rational inflation expectations based on the Michigan Survey. Grant and Thomas (1999) confirm this result with more recent data from the Michigan Survey and find that the same is true for the Livingston Survey. Andolfatto, Hendy, and Moran (2008) achieve the same result using a calibrated DSGE model.³

Thomas (1999) and Mehra (2002) find in their comparison of surveys that households and experts both are more precise than naive econometric forecasts. Contrary to many other papers, Ang, Bekaert, and Wei (2007) find that experts outperform households; however, they also find that both expert and

¹ Recent contributions include Orphanides and Williams (2005) and Adam, Evans, and Honkapohja (2006).

² Thus, while criticizing Gramlich, the authors also strengthen his result that private households outperform professionals.

³ All of these papers use the rationality definition of Muth (1961). However, rational inflation expectations according to Muth's technical criteria do not necessarily match inflation expectations that are formed based on all available information when (rationally) considering information (and computing) costs. Branch (2004) shows that heterogeneous and imprecise expectations are well in line with rationality when information is not free of cost.

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