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Inflation forecast uncertainty

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Abstract

We study the inflation uncertainty reported by individual forecasters in the Survey of Professional Forecasters 1969–2001. Three popular measures of uncertainty built from survey data are analyzed in the context of models for forecasting and asset pricing, and improved estimation methods are suggested. Popular time series models are evaluated for their ability to reproduce survey measures of uncertainty. The results show that disagreement is a better proxy of inflation uncertainty than what previous literature has indicated, and that forecasters underestimate inflation uncertainty. We obtain similar results for output growth uncertainty.

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1. Introduction

Modern economic theory predicts that agents' behavior depends on their assessment of the probabilistic distribution of future economic data. It is only under very restrictive assumptions that the point forecast is sufficient to characterize their choices. In general, higher moments also matter. This paper focuses on *inflation uncertainty* as measured by the Survey of Professional Forecasters (SPF) since the late 1960s. It also studies the *real GDP growth uncertainty* from the same survey, which is only available since the early 1980s.

The most common way to assess forecast uncertainty is by estimating some kind of time series model. There are several situations when survey data on expectations/

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uncertainty are preferable to time series models, for instance, when

- a series has recently undergone a structural change, for example, the adoption of an inflation target;
- different time series methods disagree and it is difficult to point out the best method;
- whenever an empirical rather than a normative measure of uncertainty is needed, so that the interest focuses on actual agents' expectations.

As an example, consider Sargent's (1993) claim that a policy of reducing the inflation rate need not cause any output loss – provided the change in regime is credible. To be made operational, the claim needs a measure of credibility. One way to assess credibility is then to consider the mean and width of agents' forecast error bands. As another example, forecast error bands make it possible to evaluate the credibility of inflation targets, including the tolerance intervals, used by many central banks. In such circumstances a survey measure of uncertainty has clear advantages over an econometric estimate. If a change in regime is suspected, these advantages are magnified.

But even if having a measure of uncertainty from survey data is often desirable, there is no clear, uncontroversial, way of extracting such a measure. A main concern of the paper is to show the conceptual and practical importance of how the survey data is used.

The first issue we discuss is how to think about inflation and GDP growth uncertainty when every forecaster reports his own perceived uncertainty, but also disagrees with other forecasters on the point forecast. We use a simple theoretical framework to highlight that the relevant definition of uncertainty depends on its intended use. For example, we maintain that previous findings (Diebold et al., 1999) that forecasters overestimate inflation uncertainty are based on an inappropriate definition of uncertainty, and that the conclusion ought to be reversed.

The second issue we discuss is how uncertainty can be estimated from the individual answers. Using improved (more robust) estimation techniques, we conclude that disagreement on the point forecast, a readily available but (at present) theoretically unfounded measure of uncertainty, is a better proxy for more theoretically appealing measures than previously thought (Zarnowitz and Lambros, 1987). We also show that recent forecasting errors have stronger effects on perceived uncertainty (as in an ARCH model) than found in previous studies (Ivanova and Lahiri, 2000), and that a whole range of different time series models all fail to keep up with regime changes in U.S. inflation uncertainty (especially in the early 1980s).

The rest of the paper proceeds as follows. Section 2 presents the data in the Survey of Professional Forecasters. Section 3 discusses alternative measures of uncertainty from the survey data. Section 4 discusses the estimation of uncertainty. Section 5 presents the empirical results, and Section 6 concludes.

2. The Survey of Professional Forecasters

The data used in this paper are from the Survey of Professional Forecasters (SPF), which is a quarterly survey of forecasters' views on key economic variables. The

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