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Can rational stubbornness explain forecast biases?

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ABSTRACT

This paper examines whether the rational jumpiness/stubbornness hypothesis can explain forecast biases. Using a dataset of professional GDP forecasts for the G7 countries over the period 1989–2010, we find evidence supporting the rational stubbornness hypothesis. Specifically, forecasters underreact more when large forecast revisions are highly indicative of low forecast ability. Underreaction is less likely when the size of forecast revisions is unrelated to ability. These findings are consistent with the hypothesis that forecasters choose to smooth GDP forecasts to maximize their perceived ability.

1. Introduction

Over the past decades, the efficiency of macroeconomic forecasts has been comprehensively tested for various economic series and countries.[1] Forecast efficiency has regularly been rejected on the grounds that forecast revisions are correlated with their lagged values. This has traditionally been interpreted as evidence of forecast underreaction (positive autocorrelation of forecast revisions), or overreaction (negative autocorrelation). Various explanations, involving cognitive or strategic biases, have been proposed to rationalize predictable forecast biases that are caused by underreaction and overreaction (Chen and Jiang, 2006; Ottaviani and Sorensen, 2006).

Ehrbeck and Waldmann (1996) propose a simple explanation of predictable forecast biases, which is called the rational bias hypothesis. They assume that forecast accuracy is not central in determining forecasters' reputation, because the market (i.e. outside observers) forms beliefs on forecasters' ability before observing their accuracy. Hence, forecasters do not minimize forecasts errors, but rather mimic the forecasting pattern of well-informed forecasters in order to convince the market of their forecast ability. In this setting, they show that forecasters will rationally underreact of overreact. In the initial version of their model, agents are reluctant to fully revise previous forecasts, because large revisions signal that previous forecasts were wrong. In those situations, forecasters are expected to insufficiently adjust forecasts upon the arrival of new information; which is termed "rational stubbornness". In the subsequent version of the model (which is based on different assumptions), forecasters are instead willing to "over-revise" forecasts, because large revisions signal the arrival of new information, which is typical of high ability forecasters. In those situations, forecasters are expected to overreact to new

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[1] Forecast efficiency has been for instance tested, and rejected, for output and inflation for the United Kingdom (Harvey et al., 2001), the United States (Davies and Lahiri, 1995), the G7 countries (Lahiri and Sheng, 2008; Dovern and Weisser, 2011), and a panel of developed economies (Ager et al., 2009).

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information, which is labelled "rational jumpiness". In sum, Ehrbeck and Waldmann show that it may be rational to produce biased forecasts to maximize perceived ability.

The rational bias hypothesis is very intuitive, and has regularly been cited as a possible source of forecast inefficiencies (Clements, 2010; Kirchgässner and Müller, 2006; Laster et al., 1999; Tillmann, 2011). However, only a few studies have actually attempted to test it. Ehrbeck and Waldmann (1996) introduce a simple test: if the rational bias hypothesis is correct, forecasters should choose to overreact (underreact) when large forecast revisions are indicative of high (low) forecast ability. Using Treasury Bills yields forecasts, they find that forecasters overreact despite the negative correlation between the size of revisions and ability, which is inconsistent with the rational bias hypothesis. Likewise, Ashiya (2003) rejects the rational bias hypothesis using Japanese output forecasts because ability is unrelated to the size of forecast revisions. On the other hand, Peterson (2001) finds evidence supporting rational stubbornness using yield curve forecasts: forecasters underreact, and there is a negative correlation between size of revisions and ability. Overall, the evidence has been mixed and scarce, and more work is required to assess the empirical validity of the rational bias hypothesis.

In this paper we re-examine the validity of the rational bias hypothesis, and extend previous research in two novel ways. First, we review the theory of rational bias and extend existing models. Second, we propose a new empirical test that exploits the multi-horizon feature of our dataset. Our theoretical contribution is to introduce a statistical model, from which we derive a general condition for the decision to underreact or overreact. We show that the previous models of rational jumpiness/stubbornness (Ehrbeck and Waldmann, 1996; Prendergast and Stole, 1996) are special cases of a more general model. In sum, our contribution is to clarify the situations in which we can expect forecast overreaction and underreaction.

Our second and most important contribution is empirical. We test the rational bias hypothesis using a dataset of professional GDP growth forecasts for the G7 countries for the years 1989–2010. We propose a new test that exploits the multi-horizon feature of the *Consensus Economics* dataset. By imposing an additional condition for non-rejection of the rational bias hypothesis, this new test is more powerful than the standard one. Our test is based on the conjecture that changes in the correlation between ability and size of revisions should be reflected in forecast behavior. If, for instance, the correlation between ability and the size of revisions is strongly negative during certain periods, we expect forecasters to underreact more during such periods. We find that professional forecasters, on average, underreact to new information. Our analysis then reveals that the forecast horizons characterized by heavy underreaction are usually those for which the correlation between forecast revisions and ability is the most negative. Conversely, forecasters underreact less at forecast horizons where the correlation is closer to zero. Thus, forecasters underreact more when they can benefit more from doing so. In the light of this evidence, we conclude that rational stubbornness may explain observed forecast biases. Professional forecasters seemingly refrain from fully adjusting forecasts to new information in order to increase their perceived ability.

This article is organized as follows. In Section 2 we review the theory of rational bias. Section 3 presents the dataset, whereas Section 4 details our empirical test and presents the main results. Finally, Section 5 concludes.

2. The rational bias hypothesis

Ehrbeck and Waldmann (1996) and Prendergast and Stole (1996) assume that outside observers form beliefs on forecasters' ability before observing the accuracy of the forecasts.[2] Forecast accuracy may not directly affect forecasters' reputation. The rational bias hypothesis postulates that, since accuracy is not central in determining compensation, forecasters will seek to increase their reputation by mimicking the forecast pattern of informed forecasters. This assumption probably has some relevance for macroeconomic forecasts, which are often made one or two years before official figures are released. By the time official figures are eventually released, forecasters who turned out to be accurate would not necessarily be rewarded, as outside observers may not retrospectively estimate ability based one or two years old forecasts.

Some have argued that forecast biases are instead caused by herd and anti-herd behavior. For Scharfstein and Stein (1990), forecasters may display herd behavior given the superior information of consensus forecasts. Effinger and Polborn (2001), on the other hand, show that forecasters may anti-herd when there is a value in being the single-best forecaster. Another possibility is that forecasters care about forecast accuracy per se. Forecasters may for instance minimize a symmetric or asymmetric loss function that depends on forecast errors. Asymmetric loss functions have been found to fit the data better than symmetric loss functions (Christodoulakis and Mamatzakis, 2009; Elliott et al., 2005). Interestingly, asymmetric loss functions also cause forecast biases, as underprediction may be more heavily penalized than overprediction (Elliott et al., 2005). Unlike the rational bias literature, the loss function literature assumes that no factors other than forecast errors enter the objective function. It is unclear how important accuracy truly is. Laster et al. (1999) find indirect evidence that both accuracy and publicity generated by unconventional forecasts contribute to greater compensation. Forecasters who are consistently accurate may eventually be rewarded, but factors other than accuracy may also contribute to their compensation. More empirical work is needed to better understand how much weight forecasters place on minimizing errors, and how significant strategic biases are.

[2] Note that Prendergast and Stole (1996) is not as such a model on forecasting, since they examine how reputational concerns affect a manager's incentives to make bold decisions. However their statistical model can directly be applied to forecasting decisions without any modification.