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Do inflation targets anchor inflation expectations?

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ABSTRACT

We suggest a simple test of whether an inflation target anchors private-sector inflation expectations. The test is easy to compute and it is robust to various sources of misspecification. The test may be a useful alternative to dispersion measures commonly studied in research on inflation targeting. Using data for 22 inflation targeting countries, we find for many countries that the forecasters scatter their inflation forecasts away from the inflation target. We account for the endogeneity of inflation targets, we study the variability of our finding across countries and across time, and we study to which extent our results depend on the level and variability of inflation targets.

1. Introduction

Inflation targeting is currently adopted by 27 countries (Hammond, 2012). Proponents of inflation targeting often argue that inflation targeting helps to anchor inflation expectations. Researchers commonly use survey data on professional economists' inflation forecasts to study the effect of inflation targeting on inflation expectations. For example, Levin et al. (2004) find that a credible inflation target, in addition to reducing the persistence of inflation, decouples long-run inflation expectations from inflation dynamics. Similarly, Demertzis et al. (2009) find that, in the long run, inflation targets have contributed to anchor inflation expectations. While this result also applies to aggregate EMU data, van der Cruijsen and Demertzis (2011) show that a long-run decoupling of inflation expectations from inflation dynamics is not necessarily a feature of the data at the level of individual EMU countries. Johnson (2002) finds that inflation targeting implies that forecasters expect lower inflation rates and that inflation targeting does not affect the dispersion of forecasts after accounting for the effects of past inflation rates. Results reported by Cecchetti and Hakkio (2009) corroborate the latter finding. They do not find evidence that inflation targets lower the dispersion of professional economists' inflation forecasts. Siklos (2013), in a recent paper, reports that inflation targets have no or even a positive effect on the dispersion of inflation forecasts. Capistrán and Ramos-Francia (2010), in contrast, find that the dispersion of inflation forecasts tends to be smaller in inflation targeting countries than in countries that have not officially adopted an inflation target. A consensus, thus, has not yet emerged in the literature on the link between the adoption of an inflation target and the dispersion of inflation forecasts.

Results of theoretical research on the optimality of central bank transparency cast doubt that such a consensus will ever emerge. Walsh (2007) points out that the optimal degree of central bank transparency may be sensitive to the relative importance and persistence of demand and supply shocks. In consequence, if the nature of shocks changes over time, or if the relative contribution of demand and supply shocks to macroeconomic fluctuations varies across countries, the effect of adopting an inflation target on the dispersion of inflation expectations is likely to change as well. It, thus, would be preferable to have an alternative test available of the anchoring effect of inflation targets on inflation expectations that is insensitive to such shocks. We propose such an alternative test. Our test does not require any assumption of a structural model, nor does it require estimating the effect of inflation shocks on inflation expectations. Moreover, our test fully exploits the cross-sectional and the time-series dimension of survey data of inflation forecasts, and, unlike the tests considered by, for example, Capistrán and Ramos-Francia (2010) and Siklos (2013), it does not require computation of the dispersion of forecasts. For this reason, our test is robust to phenomena that may distort tests relying on the dispersion of forecasts. For example, a change in the dispersion of inflation forecasts may arise due to the occurrence of a macroeconomic shock that is completely unrelated to the adoption of an inflation target. Conventional dispersion-based analyses of the link between inflation targets and the dispersion of inflation expectations, thus, require controlling for such macroeconomic shocks. Our alternative test, in contrast, is robust to the occurrence of macroeconomic shocks because macroeconomic shocks affect the

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two components of our test in opposite directions, leaving the average of the two components unaffected. Furthermore, our test directly incorporates the inflation target into the analysis and does not rest on a comparison of the degree of inflation anchoring in inflation-targeting and non-inflation-targeting countries.

Bernhardt et al. (2006) have originally developed our alternative test to study herding behavior of financial analysts. Recent applications of their test include Naujoks et al. (2009) and Pierdzioch and Rülke (2012a, b, forthcoming-a). The test is particularly suited to address the influence of an inflation target on private-sector forecasts because herding refers to a situation where forecasts are anchored by some public reference forecast which, in the finance literature, is typically measured by means of the consensus forecast. In our study, the inflation target represents the public reference forecast. We apply the test to study more than 80,000 private-sector inflation forecasts and find that, in many inflation-targeting countries, forecasters appear to scatter their inflation forecasts away from the inflation target. It, thus, seems that inflation targets repel rather than anchor inflation expectations, at least at the current-year and next-year forecast horizons that we consider in our empirical analysis.

Because we derive our empirical findings only from short-term inflation expectations, the repelling effect that we find in our empirical analysis does not necessarily imply that inflation targets do not help to anchor inflation expectations per se. Rather, our findings complement results of earlier researchers who typically have studied anchoring effects of inflation targets using long-run inflation expectations with forecast horizons of several years (see, for example, Demertzis et al., 2009). By the same token, our empirical findings are not necessarily at odds with theories that emphasize that individuals can use inflation targets as focal points to coordinate their expectations (Demertzis and Viegi, 2008). While inflation targets may serve as focal points in the long run, however, our empirical findings show that forecasters often do not use them as focal points in the short run.

The remainder of this study is structured as follows. Section 2 contains a description of the alternative test, Section 3 presents the empirical analysis and some robustness tests, while Section 4 contains some concluding remarks.

2. An alternative test

Fig. 1, adapted from Pierdzioch and Rülke (forthcoming-a), illustrates the intuition motivating our alternative test. We consider a forecaster, *i*, who, given some information set and a potentially asymmetric distribution over the future inflation rate, forms in period of time *t* an efficient median-unbiased private forecast $\left(\tilde{E}_{i,t}[\pi_{t+1}]\right)$ that, under the null hypothesis, is not influenced by the inflation target in period $t+1$ (π^{IT}_{t+1}). The forecast will be unbiased and the probability that it overshoots or undershoots the future inflation rate (π_{t+1}) should be 0.5. If an inflation target anchors the private forecast as in Panel A of Fig. 1, the eventually published forecast ($E_{i,t}[\pi_{t+1}]$) is closer to the inflation target than the private forecast. If the private forecast exceeds the inflation target as in Fig. 1, the probability that the anchored published forecast overshoots the subsequently realized inflation rate, thus, is smaller than 0.5. If the private forecast is smaller than the inflation target, in turn, the anchored published forecast exceeds the private forecast and the probability that it undershoots the subsequently realized inflation rate is also smaller than 0.5. In contrast, if the inflation target "repels" private forecasts as in Panel B of Fig. 1, a forecaster submits a forecast that is placed farther away from the inflation target. If the private forecast is larger than the inflation target, the published forecast is larger than the private forecast, implying that the probability that the published forecast overshoots the subsequently realized inflation rate is larger than 0.5. If the private forecast is smaller than the inflation target, the probability of undershooting the future inflation rate is also larger than 0.5.

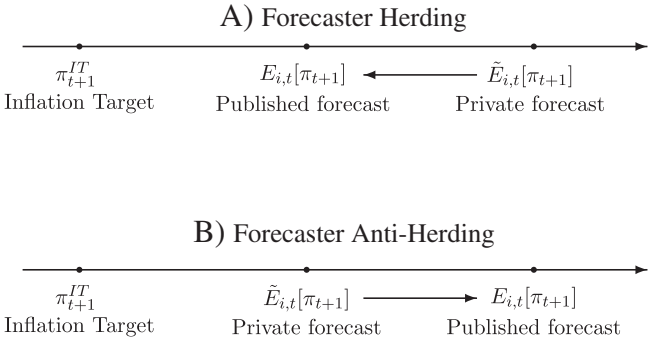

Fig. 1. Anchoring and repelling of forecasts. Panel A: forecaster herding. Panel B: forecaster anti-herding.

A test of anchoring or repelling of forecasts can be setup following Bernhardt et al. (2006). Under the null hypothesis that forecasters publish inflation forecasts that are neither anchored nor repelled the conditional probability, *P*, that a forecast of the inflation rate overshoots (undershoots) the realized inflation rate should be 0.5. Specifically, the overshooting (undershooting) probability, given a forecast that exceeds (falls short of) the inflation target, is

$$P_o = P\left(\pi_{t+k}<E_{i,t}[\pi_{t+k}]\,|E_{i,t}[\pi_{t+k}]>\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right) = 0.5, \tag{1}$$

$$P_u = P\left(\pi_{t+k}>E_{i,t}[\pi_{t+k}]\,|E_{i,t}[\pi_{t+k}]<\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right) = 0.5, \tag{2}$$

where *k* denotes the forecast horizon. The conditional overshooting, P_o, and undershooting, P_u, probabilities, thus, average to 0.5 under the null hypothesis. This is not the case under the alternative hypotheses of anchoring or repelling of forecasts. As Fig. 1 illustrates, anchoring of inflation forecasts implies that a forecaster publishes an inflation forecast that shifts towards the inflation target. The conditional probability that such an anchored published forecast that exceeds the inflation target will overshoot the future inflation rate should be smaller than 0.5. By the same token, if the biased published forecast shifts towards the inflation target from below, the conditional probability of undershooting is also smaller than 0.5. We have

$$P_o = P\left(\pi_{t+k}<E_{i,t}[\pi_{t+k}]\,\middle|\,E_{i,t}[\pi_{t+k}]>\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right)<0.5, \tag{3}$$

$$P_u = P\left(\pi_{t+k}>E_{i,t}[\pi_{t+k}]\,\middle|\,E_{i,t}[\pi_{t+k}]<\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right)<0.5. \tag{4}$$

Hence, if an inflation target anchors inflation forecasts, the average of the conditional overshooting and undershooting probabilities is smaller than 0.5. In contrast, if an inflation target repels inflation forecasts, the average of the conditional overshooting and undershooting probabilities is larger than 0.5. In the case of repelling, inflation forecasts switch away from the inflation target, implying

$$P_o = P\left(\pi_{t+k}<E_{i,t}[\pi_{t+k}]\,\middle|\,E_{i,t}[\pi_{t+k}]>\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right)>0.5, \tag{5}$$

$$P_u = P\left(\pi_{t+k}>E_{i,t}[\pi_{t+k}]\,\middle|\,E_{i,t}[\pi_{t+k}]<\pi^{IT}_{t+k}, \pi_{t+k}\neq E_{i,t}[\pi_{t+k}]\right)>0.5. \tag{6}$$

Adapting the notation used by Bernhardt et al. (2006, p.663) and Frenkel et al. (forthcoming), we compute the conditional over- and