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Forecast revisions of Mexican inflation and GDP growth

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ABSTRACT

We analyze the forecasts of inflation and GDP growth contained in the Banco de México's Survey of Professional Forecasters for the period 1995–2009. The forecasts are for the current and the following year, and comprise an unbalanced three-dimensional panel with multiple individual forecasters, target years, and forecast horizons. The fixed-event nature of the forecasts enables us to examine their efficiency by looking at the revision process. The panel structure allows us to control for aggregate shocks and to construct a measure of the news that impacted expectations in the period under study. We find that respondents anchor to their initial forecasts, updating their revisions smoothly as they receive more information. In addition, they do not seem to use publicly-known information in an efficient manner. These inefficiencies suggest clear areas of opportunity for improving the accuracy of the forecasts, for instance by taking into account the positive autocorrelation found in forecast revisions.

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1. Introduction

It has become common practice in several central banks and other institutions to design and collect surveys containing professionals' forecasts of a range of macroeconomic and financial variables. These surveys can be particularly helpful for understanding the expectation formation mechanism of private agents. Equally importantly, they can also serve as an input in a number of decision-making processes, for instance monetary policy. Given their importance, it is natural to ask about their accuracy and efficacy.

In this paper, we analyze the forecasts of inflation and GDP growth supplied by the individual respondents to the Survey of Professional Forecasters (SPF) which has been conducted monthly by the Banco de México

since 1995.¹ These forecasts comprise a three-dimensional panel dataset, with the additional dimension arising from the collection of forecasts at several horizons (Davies & Lahiri, 1995). The forecasts that we use are focused on the year-end outcome in the year in which the survey is collected, and in the following year. The forecasts are revised in response to new information which arises between surveys, and eventually form a sequence of 24 forecasts before the respective outcome is known. This type of expectation is commonly referred to as a fixed-event forecast. Following Isiklar and Lahiri (2007), we use this real-time survey data to analyze the evolution of these fixed-event forecasts over various horizons.

We study the way in which information is incorporated into these forecasts. If it is incorporated efficiently, forecast errors and revisions should not be predictable (Nordhaus, 1987). When the information incorporated is

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¹ The survey is called Encuesta sobre Expectativas de los Especialistas en Economía del Sector Privado. Banco de México is México's central bank, with webpage <http://www.banxico.org.mx>.

publicly available data that might have been employed in the construction of previous forecasts, the forecasts are said to satisfy the property of strong efficiency. If the information used is past forecast errors or revisions, then the forecasts are said to satisfy the property of weak efficiency. Note that the latter is a necessary condition for the former, but it is not sufficient.

The fixed-event nature of the forecasts enables us to examine the forecast efficiency by looking at forecast revisions. Rationality tests based on forecast revisions are attractive because they are not sensitive to the data generating process or to data revisions. This is important for Mexican data, given that Mexico adopted an inflation targeting regime in 2001, with inflation apparently changing from a very persistent process to a stationary one around that year (Chiquiar, Noriega, & Ramos-Francia, 2010).² In the case of GDP, it had a major revision in 2008, in which the base year was changed from 1993 to 2003.³ Two other advantages of using the fixed-event forecast in the SPF are that we have forecasts for reasonably long horizons (up to twenty-four months), and that these are revised on a monthly basis.⁴

The panel structure of the data makes it possible to separate forecast errors into macroeconomic aggregate shocks and forecaster-specific idiosyncratic errors (Davies & Lahiri, 1995). The aggregate shocks constitute a measure of the news that impacted GDP growth and inflation expectations in the period under study. Following Davies and Lahiri (1995) and Boero, Smith, and Wallis (2008b), we calculate a measure of the volatility of the aggregate shocks for the Mexican case. In addition, in order to take full advantage of the panel structure of the data, we consider pooling fixed-event forecasts across events and over individual respondents in order to deliver more powerful tests of forecast efficiency (Clements, 1997; Keane & Runkle, 1990).

We find that SPF respondents seem to start with a fixed value for the initial forecast, around 4.1% for inflation (during the inflation targeting period) and around 3.8% for GDP growth. Compared to the event's realization, these values appear to be too rosy, and hence these longer-run forecasts tend to under-predict inflation and over-predict GDP. The forecasters appear to start incorporating news into the forecasts around 12 and 16 months before the actual realizations of the end-of-the-year inflation and real GDP growth, respectively. We also find that forecasters anchor to their initial forecasts, updating their revisions smoothly as they receive more information.

² Mexico took the first step towards inflation targeting in 1999 and consolidated it in 2001. Starting in 2003, the long-term inflation objective for the CPI was set at 3%, with a variability interval of plus/minus 1%. See Banco de México's Monetary Program for 2003.

³ The revision was announced in April of 2008. It included, among other things, increasing the number of activities considered from 362 to 750. See <http://www.inegi.org.mx>.

⁴ Despite these advantages, the bulk of the forecast evaluation literature has focused on fixed-horizon forecasts, which are a series of predictions for different events at a fixed horizon. See for example Mincer and Zarnowitz (1969) for early work on fixed-horizon forecasts, and Capistrán and López-Moctezuma (2010) for an evaluation of fixed-horizon predictions from Banco de México's SPF.

Further results indicate the presence of inefficiencies in forecasters' use of information about the past evolution of monthly inflation and monthly measures of economic activity. All of these inefficiencies suggest that there are clear areas of opportunity for significant improvements in the accuracy of the forecasts. For instance, the positive autocorrelations found in forecast revisions could be used to predict subsequent revisions.

With respect to the aggregate shocks, we find high levels of volatility for both inflation and GDP growth around the crisis of 1994–1995. For the latter, we also find high levels of volatility around the recent global financial crisis. An important reduction in inflation uncertainty is evident following Banco de México's implementation of an inflation targeting framework. There is also a cluster of positive aggregate news to inflation around that time. Finally, GDP growth uncertainty appears to have a cyclical component.

The paper proceeds as follows. Section 2 provides information about the SPF and the data employed, and presents an analysis of the information content of the forecasts. Section 3 derives the efficiency tests used in this paper. Section 4 presents the results of the forecast efficiency tests. The estimates of the aggregate shocks and their volatility appear in Section 5. Finally, Section 6 discusses the results and concludes.

2. Data

2.1. Banco de México's survey of professional forecasters

Banco de México has been conducting the SPF on a monthly basis since September 1994. Nowadays, the SPF covers around 20 macroeconomic variables related to investment, production, labor markets, public finance and international trade. In addition, the survey also asks the professional forecasters for their views on some qualitative aspects of the Mexican economic environment.

The numbers of forecasters in the survey have varied over the years, with fewer than 15 respondents in the earlier months, and approximately 30 regular respondents in recent surveys. The specialists who participate in the survey come mainly from commercial banks and other financial institutions (57%), followed by consulting firms (29%) and industrial and academic institutions (14%) in smaller proportions. Their forecasts are gathered by mail in the second half of each month, and the un-weighted mean (consensus forecast) is published monthly by the Banco de México in a detailed report that contains the evolution of these expectations.

In this paper, we analyze the forecasts collected in the SPF that focus on predicting the current and following year of annual CPI inflation and the average GDP growth over the year, for a sample that runs from as early as January (for inflation) and March (for GDP growth) of 1995 to December 2009. Ideally, given the frequency of the survey and the structure of the data, we should be able to extract a sequence of 12 fixed-event forecasts for each forecaster for the target year 1995 (10 forecasts for GDP growth), 24 fixed-event forecasts for the target years 1996 to 2009 (22 for GDP growth in 1996), and 12 forecasts for the year

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