



# Systematic errors in growth expectations over the business cycle



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## ARTICLE INFO

### Keywords:

Macroeconomic expectations  
Forecasting  
Forecast bias  
Survey data  
Growth expectation

## ABSTRACT

We document the fact that the growth forecasts made by professional forecasters in advanced economies exhibit systematic errors, and analyze how these errors depend on the business cycle state. On average over our full sample, forecasters overestimate GDP growth. However, this result masks considerable differences across business cycle states. Growth forecasts for recessions are subject to large negative systematic errors, while forecasts for recoveries are subject to small positive systematic errors. In contrast, forecasts for expansions do not exhibit systematic errors. Thus, there is evidence that forecasters try to issue forecasts which are unbiased conditional on being in an expansion, rather than forecasts which are unbiased overall. We also show that forecasters adjust their forecasts slowly around business cycle turning points. Furthermore, we show that cross-country differences in systematic forecast errors during expansions cannot be explained by changes in trend growth rates.

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## 1. Introduction

Economics has a long history of analyzing whether macroeconomic expectations are unbiased. Starting with Holden and Peel (1990) and Mincer and Zarnowitz (1969), there have been numerous studies that have analyzed whether, for instance, growth or inflation expectations systematically under- or overestimate future growth or inflation outcomes, respectively.<sup>1</sup> This interest in macroeconomic expectations is due to the importance of such expectations for a wide range of macroeconomic issues, such as the implementation of monetary policy

and fiscal rules, corporate investment decisions, and households' consumption-saving choices.<sup>2</sup>

With few exceptions, previous studies have almost exclusively analyzed the *unconditional bias* of growth forecasts.<sup>3</sup> In contrast, this paper answers the question of whether systematic growth forecast errors depend on the state of the business cycle.<sup>4</sup>

In particular, there are three issues that have not been addressed in past studies. First, there is little evidence

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<sup>1</sup> For some recent examples of studies that have looked at issues related to forecast bias, see, inter alia, Ager, Kappler, and Osterloh (2009), Ashiya (2009), Batchelor (2007), Deschamps and Ioannidis (2013), and Dovern and Weisser (2011).

<sup>2</sup> For a detailed discussion of the relevance of expectations for macroeconomic policy, see e.g. Wieland and Wolters (2013).

<sup>3</sup> While many of these studies find that growth expectations are systematically biased (see e.g. Stekler, 2008) some studies find that, by and large, they do not exhibit systematic biases (see e.g. Ager et al., 2009).

<sup>4</sup> We believe that the term 'bias' should be reserved for the unconditional expectation of a forecast error. Thus, we prefer to speak of 'systematic (forecast) errors' whenever we make statements that are conditional on the state of the business cycle.

regarding the possibility that systematic forecast errors may be due mainly to the occurrence of recessions, with the forecasts at other times exhibiting no systematic forecast errors. Notable exceptions are the studies by [Loungani, Stekler, and Tamirisa \(2013\)](#), [Messina, Sinclair, and Stekler \(2015\)](#), and [Sinclair, Stekler, and Joutz \(2010\)](#); however, the first two studies focus exclusively on the short-run growth expectations of the Federal Reserve Bank for the United States, while the last study focuses on information rigidities during recessions. This paper provides broad-based evidence as to whether macroeconomic expectations exhibit state-dependent systematic errors by using growth expectations for a large panel of advanced economies provided by *Consensus Economics* and real-time data on actual growth rates.

Second, past studies have not looked at systematic forecast errors for recovery periods explicitly, but instead have distinguished only between recessions and expansions (see the discussion by [Fildes & Stekler, 2002](#)).<sup>5</sup> However, the time series evidence suggests that the early years of recoveries are distinct from more mature economic expansions (see e.g. [Boysen-Hogrefe, Jannsen, & Meier, 2016](#); [Kim, Morley, & Piger, 2005](#); [Kim & Nelson, 1999](#)). In particular, there is evidence that the GDP growth in the US is usually higher during recoveries than during expansions ([Sichel, 1994](#)). More specifically, the deeper a recession, the stronger the subsequent recovery ([Beaudry & Koop, 1993](#)). Theoretically, such a bounce-back effect in GDP could be rationalized by the plucking model of [Friedman \(1964, 1993\)](#), which implies that recessions are due mainly to temporary shocks that do not have permanent effects on the level of GDP. If forecasters are aware of such non-linearities, they could incorporate this into their forecasts, so that their forecasts for recovery periods would exhibit no systematic forecast errors. However, in practice such non-linearities may be hard to incorporate, and anecdotal evidence (see, e.g., European Central Bank, 2014, Box 6) suggests that forecasters tend to underestimate the strength of recoveries. Against this background, we identify recovery periods and treat them as a distinct business cycle phase.

Third, there is no broad evidence regarding the evolution of systematic forecast errors around business cycle turning points.<sup>6</sup> Here, we provide new evidence on the pattern of systematic forecast errors around business cycle turning points by combining annual information about the state of the business cycle in the target year of the forecasts with quarterly information about its state in the period when the forecast was made.

Our main findings are as follows. First, professional growth forecasts exhibit substantial biases. On average, forecasters overestimate the annual growth rate of real gross domestic product (GDP) by 0.4 percentage points.

Second, this bias is driven mainly by systematic forecast errors of forecasts made for recessions and – to a lesser extent – recoveries. We document the fact that forecasts that are made for recessions are subject to very large negative systematic forecast errors (growth expectations are too optimistic), while the forecasts that are made for recoveries are, on average, too pessimistic. Third, forecasts that are made for expansions exhibit no significant systematic forecast errors. Fourth, the adjustment of forecasts (i.e., reducing the systematic forecast error) around business cycle turning points is a gradual process, which is consistent with theories of imperfect information ([Coibion & Gorodnichenko, 2012](#); [Sims, 2003](#)), and the forecast errors made for recessions remain high after the recession began. Finally, the cross-country differences in systematic forecast errors during expansions cannot be explained by changes in trend growth rates, calling into question the explanation of growth forecast bias that was put forward by [Batchelor \(2007\)](#).

Our findings are relevant in several dimensions. Given the importance of expectations and consensus forecasts for economic policy making (e.g., for managing inflation dynamics), our results indicate that forecasts for expansions are largely reliable, in the sense that they do not have a tendency to be either too optimistic or too pessimistic. Subject to the caveat that we draw our conclusions from the analysis of aggregate growth expectations rather than individual forecasts, our results are in line with the hypothesis that professional forecasters have incentives to issue forecasts that exhibit no systematic forecast errors during expansions, rather than forecasts that are unbiased overall. In a broader context, our results help to provide a better understanding of the way in which macroeconomic expectations are formed, thereby helping to develop macroeconomic models with realistic assumptions about the expectation formation process.

The remainder of this paper is structured as follows. Section 2 briefly reviews the literature on theories that explain forecast biases and discusses why systematic forecast errors could be state-dependent. Section 3 describes our data set and the approach that we use to date recessions and recoveries. Section 4 describes the econometric approach that we use. Section 5 presents our empirical results. Finally, Section 6 concludes.

## 2. Theoretical background

This section begins by briefly reviewing potential explanations for forecast biases in general. We then discuss potential reasons why such systematic forecast errors could depend on the state of the business cycle. In general, individual forecasts may exhibit biases/systematic forecast errors because the forecasters (i) lack the skills to issue unbiased forecasts (e.g., because they are unable to learn from recent forecast errors), (ii) do not possess sufficient information to enable them to issue unbiased forecasts (e.g., because they are forecasting a system that is subject to structural change and are not able to differentiate between temporary and permanent shocks), or (iii) have incentives to rationally produce biased forecasts ([Batchelor, 2007](#)).

<sup>5</sup> A notable exception is the earlier evidence provided by [Zarnowitz and Braun \(1993\)](#). Furthermore, [Loungani \(2002\)](#) analyzes the accuracy of forecasts made for recovery years.

<sup>6</sup> [Loungani et al. \(2013\)](#) use an annual classification scheme to identify recession years, but it does not allow them to track the evolution of forecasts (relative to actual outcomes) as a function of the temporal distance between the forecast period and recession starts.

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