



# Do corporate executives have accurate predictions for the economy? A directional analysis <sup>☆</sup>



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## ABSTRACT

Although many studies on the directional accuracy of forecasts by international organizations and professional forecasters have been scrutinized, little attention has been paid to forecasts by business leaders. In order to address this gap, we use directional tests to investigate whether forecasts of Gross Domestic Product by corporate executives are valuable to their users. Our findings indicate that all the forecasts with forecast horizons from 1 to 14 months are valuable, whereas established literature indicates that longer-term forecasts tend not to be valuable. This suggests that corporate executives are concerned with and focus on longer-term economic environments and can therefore serve as an important resource for policymakers. However, some of the useful forecasts with real-time data, in particular those in the Tankan survey, are not useful with historical data.

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## 1. Introduction

Since the pioneering work of [Henriksson and Merton \(1981\)](#), non-parametric tests of directional change have been applied to investigate the directional accuracy of economic forecasts. [Schnader and Stekler \(1990\)](#) and [Stekler \(1994\)](#) introduced this approach into macroeconomic forecast evaluation, whereas [Henriksson and Merton \(1981\)](#) focused on decision making about financial assets. In the literature, the analysis of directional accuracy focuses on whether forecasts are “useful” or “valuable” to their users.

As consumer sentiments attracted considerable attention, several studies have examined the directional accuracy of consumer sentiment indices over household consumption. Among these, [Easaw and Heravi \(2004\)](#) and [Easaw et al. \(2005\)](#) find that consumer sentiment indices are useful predictors of growth in household consumption for both the UK and the United States. In analyzing the accuracy of subjective household forecasts of personal finance, [Easaw and Heravi \(2009\)](#) placed particular emphasis on the importance of consumer sentiment indices because of their use by policymakers and, ultimately, their role in monetary policy.

Recently, business surveys have gained vast attention because they usually provide the earliest information on an economy, and thus fundamental input for policymakers. For example, [Claveria et al. \(2007\)](#) investigate the possibility of improving forecasts for macroeconomic variables for the Euro area using the information provided by business surveys, and [Klein and Özmucur \(2010\)](#) examine the predictive power of business survey indices in the European Union. However, little attention has been paid to directional analysis of business survey indices. [Pesaran and Timmermann \(1992\)](#) are one of a few exceptions<sup>1</sup> that investigate business surveys of the British and French manufacturing sectors. Furthermore, studies of directional analysis have rarely focused on forecasts by business leaders whereas they have focused on two particular forecast types: those<sup>2</sup> made by international organizations such as the International Monetary Fund (IMF) and the Organization for Economic Co-operation and Development (OECD) and central banks such as the Federal Reserve System (Fed), and those<sup>3</sup> by professional forecasters and their related institutions.

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<sup>1</sup> [Tsuchiya \(2012a\)](#) also examines the directional accuracy of the Purchasing Managers’ Index (PMI) in the United States.

<sup>2</sup> See [Artis \(1996\)](#), [Ash et al. \(1998\)](#), [Ashiya \(2003\)](#), [Baghestani \(2011\)](#), [Joutz and Stekler \(2000\)](#), [Pons \(2000, 2001\)](#), and [Sinclair et al. \(2010\)](#).

<sup>3</sup> See [Ashiya \(2006\)](#), [Greer \(2003\)](#), [Lai \(1990\)](#), [Leitch and Tanner \(1995\)](#), [Öller and Barot \(2000\)](#), [Schnader and Stekler \(1990\)](#), and [Stekler \(1994\)](#).

In order to address these gaps, we use directional tests to investigate whether business survey indices and forecasts by business leaders are valuable.

Using the *Annual Survey of Corporate Behavior* (ASCB), the *Business and Investment Survey of Incorporated Enterprises* (BISIE), and the *Business Outlook Survey* (BOS), together with the methods of directional analysis, we examine whether economic predictions of the economy from business executives are useful predictors of real Japanese GDP. We also examine the Tankan survey, which is the most widely used business survey in Japan, to compare and contrast with the BOS. We investigate directional accuracy with not only the latest available (historical) data but also the initially published (real-time) data.

In order to preview our findings, we show that all forecasts and forecast horizons are useful, in marked contrast to established studies, such as that of Ash et al. (1998) and Stekler (1994). Although there are mixed results on the usefulness of near-term forecasts, considerable evidence has been reported against the usefulness of longer-term forecasts. Our finding suggests that the forecasts of business leaders include features that forecasting institutions, professional forecasters, and consumer sentiment indices overlook. The Tankan survey has been used extensively by both policymakers and investors, whereas much less attention has been paid to the ASCB, BISIE, and BOS. However, our analysis provides a new insight into those surveys for policymakers. Another remarkable finding is that some of the useful forecasts with real-time data, in particular those in the Tankan survey, are not useful with historical data.

The remaining text is organized as follows. The next section describes the data used in this paper. Section 3 explains the statistical methods of directional analysis. The remaining sections present the results of those surveys, their policy implications, and the conclusions.

## 2. Data

### 2.1. Actual data

As regards the actual outcome, we use both real-time data and historical data as of June 2012.

We collect real-time annual growth rates of real GDP from issues of the *Monthly Finance Review* published by the Ministry of Finance (MOF). Both real-time and historical data cover the sample period of the ASCB described below between fiscal years 1974 and 2011, which consists of 38 observations.

We collect real-time quarterly growth rates from two sources: the *OECD Original Release Data and Revisions Database* and the *Real-Time Historical Dataset* for the OECD compiled by the Federal Reserve Bank of Dallas.<sup>4</sup> The quarterly growth rates of real GDP are seasonally adjusted and available from the first quarter (Q1) of 1968 to the first quarter (Q1) of 2012. We restrict our data to the period after Q2 of 1983 for the BOS and after Q2 of 1984 for the BISIE to match the sample periods of actual and forecast data, respectively.

### 2.2. Forecast data

#### 2.2.1. ASCB

The ASCB is published annually by the Economic and Social Research Institute, Cabinet Office (ESRI). Every January, about 2500 firms listed in three major Japanese stock exchanges are asked about the real growth rate of the Japanese economy for the next fiscal year; the result is released in April. For example, the result of the survey for the fiscal year 2008, which is conducted in January 2009, contains forecasts for fiscal year 2009 (from April 2009 to March 2010). Therefore, the survey

contains forecasts with horizons of 14 months. Forecasts are available from fiscal years 1974 to 2011.

In order to capture the direction of change in the ASCB forecasts, we denote the forecasts with horizons of 14 months as  $f_t^A$ . Note that the direction of change is positive (negative) if  $f_t^A > 0$  ( $f_t^A \leq 0$ ). We denote the growth rate of real GDP at time  $t$  as  $a_t$  and define the direction of change in the same way.

#### 2.2.2. BISIE

The BISIE had been published quarterly by the ESRI since June 1984 and merged into the BOS in June 2004. The BISIE forecasts are available from Q2 of 1984 to Q1 of 2004, which consists of 80 observations. The survey is presented to about 4500 executives of corporations with capital of over 100 million yen; it addresses domestic economic conditions for the ongoing quarter as well as for the following two quarters. The survey takes place in the last month of the ongoing quarter. Therefore, the survey contains forecasts with horizons of 1 month, 4 months, and 7 months. We denote each figure as  $f_{t,t}^B$ ,  $f_{t,t+1}^B$ , and  $f_{t,t+2}^B$ , respectively. For example,  $f_{t,t+1}^B$  represents the forecast for the next quarter made at time  $t$ .

The survey explores the corporate executives' forecasts for the economy by asking whether domestic economic conditions are "rising," "unchanged," or "declining," relative to the preceding quarter. Note that the BISIE does not survey the real growth rate, as the ASCB does. The resulting figure, the Business Survey Index (BSI), is calculated by subtracting the percentage of respondents that report "declining" from the percentage of those reporting "rising." For example, if 40% of the respondents report rising, 30% report unchanged, and 30% report falling, then the BSI is 10 percentage points (40% minus 30%). Some BSIs are published: aggregated index, large enterprises (capital of 1 billion yen or over), and medium-sized enterprises (capital of 100 million to 1 billion yen).

A reading above zero indicates that more managers report rising than declining; this implies an increase in overall domestic economic activity.<sup>5</sup> Conversely, a reading below zero signals a decrease. Thus, an increase in real Japanese GDP (i.e., the direction of change is positive) could be interpreted as the level of the index being above zero.

In order to capture the direction of change in the BISIE forecasts, we define the following three forecasts: current-period forecasts ( $f_{t,t}^B$ ), next-period forecasts ( $f_{t,t+1}^B$ ), and two-periods-ahead forecasts ( $f_{t,t+2}^B$ ), where  $f$  denotes the level of the BSI. Note that the direction of change is defined as positive (negative) if  $f_{t,t+i}^B > 0$  ( $f_{t,t+i}^B \leq 0$ ) ( $i = 0, 1, 2$ ). We define the direction of change in real GDP as we do in the ASCB.

We evaluate the directional accuracy of the aggregate forecasts, and forecasts by large and medium-sized enterprises.

#### 2.2.3. Old BOS

The BOS has been published quarterly by the MOF since 1983 and was merged with the BISIE in June 2004 as mentioned in the previous sub-section. We call the BOS prior to the unification "old BOS" and the BOS after the unification "new BOS."

The survey is presented to about 12,000 executives of corporations with capital of over 10 million yen. It takes place in the middle month of the ongoing quarter and addresses their specific business conditions for the ongoing quarter as well as for the following two quarters. Therefore, the old BOS contains forecasts<sup>6</sup> with horizons of 1 month, 4 months, and 7 months that correspond to those of the BISIE.

<sup>4</sup> I also used the "Real-time Database" maintained by Yasuyuki Komaki for cross-checking data correctness. The two databases are consistent.

<sup>5</sup> A number of quantification methods have been suggested in the literature (e.g., Pesaran and Weale, 2006) since Anderson (1952) and Theil (1952). The most common quantification procedure, the balanced statistics, is used in this paper.

<sup>6</sup> Specifically, those forecasts in the old BOS have longer forecast horizons than the BISIE.

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