



# Do forecasters believe in Okun's Law? An assessment of unemployment and output forecasts

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## ABSTRACT

This paper provides an assessment of the consistency of unemployment and output forecasts. We show that, consistent with Okun's Law, forecasts of real GDP growth and the change in unemployment are negatively correlated. The Okun coefficient—the responsiveness of unemployment to growth—from forecasts is fairly similar to that in the actual data for various countries. Furthermore, revisions to unemployment forecasts are negatively correlated with revisions to real GDP forecasts. These results are based on forecasts taken from *Consensus Economics* for nine advanced countries since 1989.

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## 1. Introduction

Okun (1962) reported a negative short-run correlation between unemployment and output that has become known as Okun's Law, and is a staple of macroeconomic textbooks. Blanchard and Fischer (1989) include it in their chapter on useful models in *Lectures on Macroeconomics*. Blinder (1997) refers to it as a “truly sturdy empirical regularity” that constitutes part of “the core of practical macroeconomics that we should all believe”. Leading textbooks such as those of Mankiw (2012) and Romer (2012) feature Okun's Law as an empirical regularity.

This paper studies whether economic forecasters share this strong belief in the validity of Okun's Law. As Mitchell and Pearce (2010) state, “if stable empirical relationships exist among macroeconomic variables, we should expect the public forecasts of professional economic forecasters

to be generally consistent with these relationships”. In this respect, this paper contributes to the literature on whether forecasters' beliefs are consistent with other commonly-used macroeconomic relationships such as the Phillips curve and the Taylor rule.<sup>2</sup>

Our work is also related to recent work on the multivariate assessment of forecasts. Sinclair, Stekler, and Carnow (this issue) note that forecast evaluation methods have traditionally examined forecasts of individual variables. However, as they argue, forecasts are “often relied upon to provide a holistic picture of the state of the economy. In that case the forecasts of all important variables should be evaluated jointly in a multivariate framework”. They suggest several methods for the joint evaluation of forecasts of several variables, and provide an application to the case of US forecasts of real growth, inflation and unemployment.

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<sup>2</sup> Fendel, Lis, and Rülke (2011) provide evidence, using data from the same source as that used in this paper, that unemployment and inflation forecasts for G7 countries are consistent with a belief in the Phillips curve. Mitchell and Pearce (2010) find that interest rates “responded more in accord with the Taylor Rule than is evident in the predictions” of US forecasters.

The source of the data used in this paper is *Consensus Economics*. We restrict our attention to a group of advanced economies – the G7 economies plus Australia and New Zealand – for which forecasts are available over a long enough time span that we can reliably estimate whether Okun's Law holds. The time period covered is 1989–2012.

Two recent papers have looked at forecasters' belief in Okun's Law. [Mitchell and Pearce \(2010\)](#) only considered forecasts for the United States and used a different data source from the one we use, viz. the *Wall Street Journal's* semi-annual survey. They found that “predictions of unemployment and real growth move in opposite directions, as per Okun's Law”. For the period 1999–2007, the Okun coefficient – the responsiveness of unemployment changes to GDP growth – is about  $-0.6$  in the data and about  $-0.75$  in the forecasts.

The second paper is by [Pierdzioch, Rülke, and Stadtmann \(2011\)](#). They use the same data source as in this paper, roughly the same set of countries (the G7), and a sample period from 1989 to 2007. One difference between their work and ours is that they use individual-level forecasts, whereas we use the mean of the individual forecasts, the so-called “consensus”. Setting aside this difference, our work makes three contributions that bolster their finding that forecasters believe in Okun's Law. First, we provide a comparison of Okun's Law as estimated from the forecasts with that in the data, drawing on the recent work of [Ball, Leigh, and Loungani \(2013\)](#). Second, we exploit the availability of repeated revisions of the forecasts to show that the revisions in unemployment forecasts are related to revisions in real GDP forecasts in a manner which is consistent with Okun's Law. Third, the five years that we add to their sample period are the momentous ones of the Great Recession, during which both Okun's Law and forecasters' beliefs in it were subjected to a severe test.<sup>3</sup>

The remainder of the paper is organized as follows. Section 2 describes the structure of forecasts of unemployment and real GDP, and our procedure for estimating Okun's Law using these forecasts. In Section 3, we compare estimates of the Okun's coefficient from forecasts to those in the data. Section 4 presents evidence on the relationship between forecast revisions in unemployment and output. Conclusions are in Section 5.

## 2. Estimating Okun's Law with forecasts

### 2.1. Structure of forecast data

The forecasts we use have been being published by Consensus Economics, Inc. on a monthly basis since October 1989 for major advanced economies. For each country, there are between 10 and 30 forecasters. As has been noted, we use the arithmetic mean of these forecasts, the consensus. The countries consist of the G7 plus Australia

and New Zealand, which is the set of countries for which a long time series of forecasts is available. In addition to consensus forecasts, our data set includes the (actual) real GDP growth and unemployment rates from the IMF's *International Financial Statistics*.<sup>4</sup>

The events being forecasted are year-on-year real GDP growth and the annual average unemployment rate. Every month, a new forecast is made for each event and for two target years, the current year and the year ahead. Hence, we have a sequence of 24 forecasts for each target year; we index this sequence by  $h$  (for horizon), with  $h = 24$  denoting forecasts made in January of the previous year and  $h = 1$  denoting forecasts made in December of the current year. We refer to forecasts made during the target year ( $h = 1-12$ ) as current-year forecasts and those made in the year before the target year ( $h = 13-24$ ) as year-ahead forecasts. The basic properties of the data and the forecasts are discussed in the [Appendix](#). The forecasts display the reasonable property that the frequency distribution of forecasts starts to mirror the frequency distribution of the data as the forecast horizon shortens. Moreover, the magnitude of the forecast errors declines with the horizon.<sup>5</sup>

### 2.2. Estimating Okun's Law

Okun's Law is generally written as:

$$U_t - U_t^* = \beta(Y_t - Y_t^*) + \varepsilon_t, \quad \beta < 0, \quad (1)$$

where  $U_t$  is the unemployment rate,  $Y_t$  is the log of output, and \* indicates a long-run level. As [Ball et al. \(2013\)](#) discuss, the magnitude of the Okun coefficient “is difficult to pin down a priori. It depends on the costs of adjusting employment, which include both technological costs such as training and costs created by employment protection laws. The coefficient also depends on the number of workers who are marginally attached to the labor force, entering and exiting as employment fluctuates”. Since these factors vary across countries, it is quite likely that the Okun coefficient will also differ across countries.

In addition to the “levels” or “gap” version shown in Eq. (1), there is also a “changes” version of Okun's Law:

$$\Delta U_t = \alpha + \beta \Delta Y_t + \omega_t, \quad (2)$$

where  $\Delta$  is the change from the previous period. This equation follows from Eq. (1) if the natural rate  $U^*$  is assumed to be constant and the potential output  $Y^*$  is assumed to grow

<sup>3</sup> [Tillmann \(2010\)](#) finds that “individual forecasts for output growth and unemployment submitted by FOMC members suggest that the link between these two variables weakened significantly” in the 1990s, which he suggests arose because “policymakers were aware of a change in labor productivity” over this period.

<sup>4</sup> It may be preferable to use the early releases of the unemployment and GDP data (since it is likely that these are closer to the objects that the forecasters were trying to predict) rather than the final revised data. In practice, however, the choice of the early release (or ‘real time’) data vs. final data does not make much difference, as [Guisinger and Sinclair \(2015\)](#) show in their comment on this paper. Similarly, [Pierdzioch et al. \(2011\)](#) find that the estimates of Okun's Law for the US are similar whether one uses the final or real time data from the Federal Reserve Bank of Philadelphia database.

<sup>5</sup> Both unemployment and real GDP forecasts show a negative bias (that is, the forecasts over-estimate both unemployment and real GDP growth). Moreover, the bias in unemployment declines from  $h = 24$  to  $h = 10$  and then increases; while this pattern is difficult to explain, the magnitude of the bias is quite small. Explaining these biases is not the focus of the paper and they do not affect the reliability of the main results.

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