Available online at www.sciencedirect.com
ScienceDirect
International Journal of Forecasting 27 (2011) 466–481
www.elsevier.com/locate/ijforecast

Real-time macroeconomic forecasting with leading indicators: An empirical comparison

Christiaan Heij*, Dick van Dijk, Patrick J.F. Groenen

Econometric Institute, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands

Abstract

This paper demonstrates that the Conference Board's Composite Leading Index (CLI) has significant real-time predictive ability for Industrial Production (IP) growth rates at horizons from one to six months ahead over the period 1989–2009. A popular but unrealistic analysis, which combines real-time data for CLI and final vintage data for IP as predictor variables, obscures the actual predictive content of the CLI, in the sense that in that case, the improvements in forecast accuracy relative to a univariate AR model are not significant. The CLI appears to be less useful for forecasting growth rates of the Conference Board's Composite Coincident Index (CCI) in real time, as a univariate AR model performs better. This result is mostly due to its disappointing performance during the first five years of the forecast period. The CLI may not be the best way of exploiting the information contained in the underlying individual leading indicator variables. The use of principal components instead of CLI leads to more accurate real-time forecasts for both IP and CCI growth rates.
© 2010 International Institute of Forecasters. Published by Elsevier B.V. All rights reserved.

Keywords: Vintage data; Leading indicators; Forecast evaluation; Recessions; Industrial production; Composite Coincident Index

1. Introduction

Statistical agencies face a tradeoff between accuracy and timeliness in the construction and publication of macroeconomic time series such as output and employment. The quality of measurements of these variables improves if they are based on more complete sample information. However, collecting the necessary data takes time, while both the government and the public benefit from having such key macro variables available as soon as possible for making their policy and consumption and investment decisions. Many statistical agencies have chosen a compromise solution by releasing a first estimate with a relatively short delay (usually one or two months after the end of the relevant calendar period), but then revising this initial value as more information becomes available.

These data revisions are often substantial, and may still take place several months and even years after the initial releases, while their characteristics appear to be time-varying and subject to business cycle fluctuations; see Aruoba (2008) and Swanson

* Corresponding author. Tel.: +31 10 4081278; fax: +31 10 4099162.
E-mail address: heij@ese.eur.nl (C. Heij).

0169-2070/$ - see front matter © 2010 International Institute of Forecasters. Published by Elsevier B.V. All rights reserved.
doi:10.1016/j.ijforecast.2010.04.008

and Van Dijk (2006), among others. Such revisions obviously affect various aspects of macroeconomic analysis, including policy evaluation and out-of-sample forecasting, see Croushore (2006, in press).

Data revisions may be particularly influential when it comes to out-of-sample forecasting, given that such forecasts typically rely upon the observations for the most recent periods, which may still be subject to substantial revisions. In a seminal contribution, Diebold and Rudebusch (1991) documented the possible effects of using real-time data for forecasting purposes. Based on monthly vintage data for the 1970s and 80s, they demonstrate that the Conference Board's Composite Leading Index (CLI) helps substantially in forecasting Industrial Production (IP) if 'ex post' (that is, revised) data are used. However, the usefulness of CLI evaporates completely in real-time forecasting, and in many cases a simple autoregressive (AR) model involving only lags of IP performs best. An important feature of their analysis is that, while they use real-time data for the CLI, revised data obtained from the final available vintage are used for IP.

The main goal of our paper is to reconsider the questions posed by Diebold and Rudebusch. In particular, we intend to conduct a genuine real-time forecasting experiment, using the values that were available in real-time, at the moment the forecasts were actually made, for all variables. In addition, we address the question of whether the CLI provides the best way of extracting the predictive information available from individual leading indicators. Although the CLI is commonly used in forecasting, it is still of interest to consider alternative approaches, such as principal components.

Our main results are the following. We find that the Conference Board's CLI does have significant real-time predictive ability for forecasting IP growth rates at horizons from one to six months ahead over the period 1989–2009. Using real-time data for both IP and CLI, statistically significant reductions in mean squared errors (MSE) of between 8% and 15%, relative to an AR benchmark, can be achieved. Combining real-time data for CLI with final vintage data for IP, as Diebold and Rudebusch (1991) did, masks the predictive content of the CLI, in the sense that, in this setting, the improvements in forecast accuracy are no longer significant at horizons of three and six months.

The CLI turns out to be less useful for forecasting growth rates of the Conference Board's Composite Coincident Index (CCI), as no MSE gains relative to a univariate AR model are obtained. This result is mostly due to a disappointing performance during the first five years of the forecast period.

We also find that the CLI is not the best way of exploiting the information contained in the underlying individual leading indicator variables. While including them as separate regressors in a linear forecasting model actually worsens the forecast performance, constructing alternative diffusion indexes by means of principal components leads to more accurate real-time forecasts for both the IP and CCI growth rates.

Real-time forecasting is also discussed, for instance, by Clements and Galvo (2006), Croushore and Stark (2001), Pesaran and Timmermann (2005), Swanson (1996) and Swanson, Ghysels, and Callan (1999); see also the survey paper by Croushore (2006). Recently, the Conference Board has reported positive results for real-time forecasts of the Composite Coincident Index (CCI), as the CLI provides significant forecast gains over the AR benchmark model, see McGuckin, Ozyildirim, and Zarnowitz (2007). These and most other real-time forecast studies are concerned with the US, but some recent applications have dealt with the euro area, for instance Golinelli and Parigi (2008) and Ozyildirim, Schaitkin, and Zarnowitz (2009).

The remainder of the paper is organized as follows. The data set, consisting of vintage data of various coincident and leading indicators, is described in Section 2. Both the competing forecast methods and different data specifications are laid out in Section 3. The real-time forecast results for IP and CCI growth rates are discussed in Section 4 and Section 5 concludes.

2. Data

2.1. Vintage data

Our data set consists of monthly observations for the ten leading indicators and four coincident indicators (including industrial production, IP) underlying the Conference Board's Composite Leading Index (CLI) and Composite Coincident Index (CCI). The individual series are listed in Table 1. The *Business*

Download English Version:

https://daneshyari.com/en/article/998350

Download Persian Version:

https://daneshyari.com/article/998350

Daneshyari.com