The use of consumer and business surveys in forecasting

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ABSTRACT

Surveys improve forecasting performance by adding explanatory power to a model which is based on only past values of manufacturing growth. The issue addressed in this paper is whether surveys of production expectations, when added to equations that contain lagged values of a headline index pertaining to the real economy, improve forecasting performance. If so, it may be better for researchers to use not just the headline index, but production expectations or the Economic Sentiment Indicator if they wish to better predict manufacturing growth.

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1. Introduction

Global recession has proved that no country or group of countries, including the Euro area[1] and the European Union,[2] is immune to adverse developments in other countries. The drop in industrial production in the European Union (EU27) was unprecedented in recent history (Fig. 1). After five three-year growth cycles during the post-1990 era, a freefall in production started in early 2008. The index of manufacturing, which was 80.47 (2005 = 100 in January 1990), reached its peak of 113.34 in February 2008, and declined to 90.27 in July 2009.[3] The costs of these developments in production and employment are immense and bring up the question of the predictability of such drops in economic activity and the usefulness of those forecasts for decision makers.

Although financial data are available in real time, most of the variables related to real side of the economy are available only monthly or even quarterly (in case of gross domestic product). On the other hand, most economic analysis involves real side of the economy. This situation naturally causes delays in any realistic empirical work.

The lag in the publication of data pertaining to the real economy compounds the problem.[4] For example, June industrial production in the European Union was released on August 12th (about six weeks after the end of the month). On the other hand, consumer and business surveys, which have been conducted in member countries of the European Union, are released at the end of every month.[5] For example, August survey results were released on August 28th. There is about a two-month lead in the release of survey data compared with the release of industrial-production figures.

The timeliness in data release is very important, especially at times of great uncertainty. It increases the significance of business and consumer survey results in forecasting even further (Kauppi et al., 1996; Klein and Özmucur, 2002a,b). This situation necessitates the use of survey results in forecasting, the primary rationale

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[1] There are 16 member states in the Euro area (EA): Belgium, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia, and Finland.

[2] There are 27 member states in the European Union (EU27): Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, and the United Kingdom.

[3] The arithmetic average growth rate for the entire period is, 1.0%, with a maximum rate of 8.8% (December 1994) and a minimum rate of negative 19.2% (February 2009).

[4] Since many countries are involved, lags in economic data releases are longer in the European Union than in the United States. For example, July industrial production was released on August 14, 2009 in the US while June industrial production in the EU was released on August 12, 2009.

[5] There are five surveys of consumer and business (with varying numbers of questions). They pertain to: Industry, Construction, Retail, Services, and Consumers. Results of these surveys are used to construct Confidence Indicators, which are then used to produce an Economic Sentiment Index (ESI) and a Business Climate Indicator (BCI). For a very detailed history and account of these surveys and workshop papers, see European Commission Directorate-General for Economic Financial Affairs (2006, 2007, 2009b). See, also Hansson et al. (2005), Kauppi et al. (1996), and Lemmens et al. (2005).
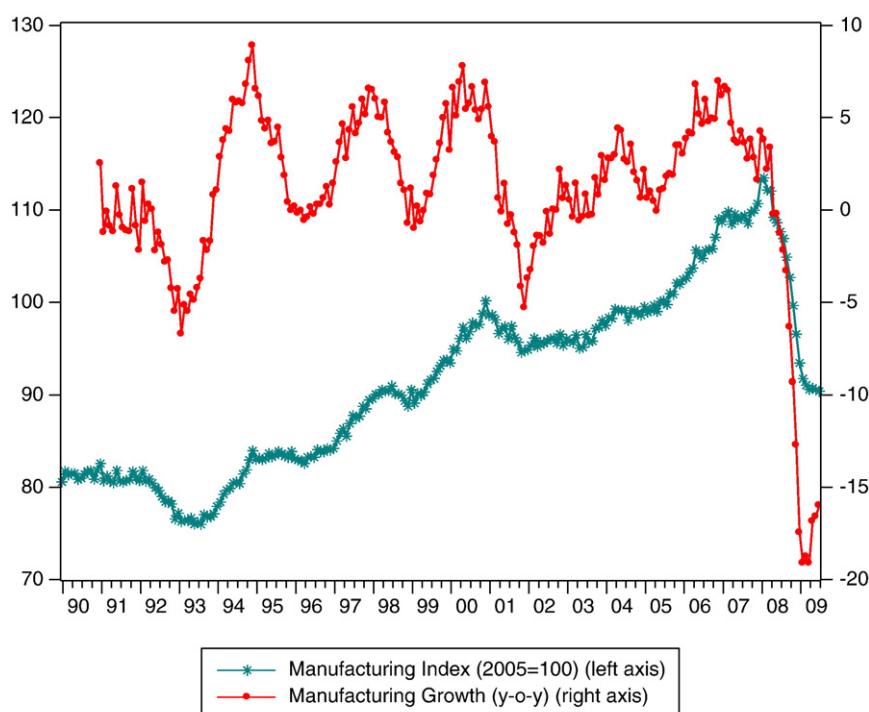
Fig. 1. European Union (EU27) manufacturing index (2005 = 100) and its annual growth (%).

for this paper. Specifically, we try to answer the following questions: 1. Do survey results contribute to accuracy in forecasting the variable of interest? 2. Although researchers tend to concentrate on the headline index, is there a better predictor among responses than the headline figure? Our empirical results indicate that answers to both of these questions are positive.

The paper is in five sections. The model is presented in the next section. The third section is devoted to empirical results that arise from estimating the model. The fourth section contains an evaluation of forecasts. The final section contains the major conclusions drawn from this research.

2. The model

Surveys are said to be useful if they increase the explanatory power of the forecasting equation. A forecasting equation may be in the form of an autoregressive-integrated-moving-average model (Deitz and Steindel, 2005), and/or include a principal component (Klein and Özmucur, 2002a,b, 2004), or VAR, TAR, SETAR, Markov Switching (Claveria et al., 2007).

Here, the simplest form proposed is (AR (12)), a specification that allows a researcher to obtain a forecast without much effort.[6]

The model to be used is in the following form (i—country, and t—time):

$$Y_{it} = \sum \beta_{ij} Y_{it-j} + \alpha_i S_{it} + \varepsilon_{it}, \; i = 1, 2, \ldots 27, \; \text{EA, EU}, \quad (1)$$

$$j = 1, 2, \ldots 12, \; t = 1991\text{M}01\ldots 2009\text{M}06$$

where, Y is the year-on-year growth[7] of the economic indicator of interest (industrial production, construction output, retail sales, services output, and consumer expenditures[8]), and S is the indicator

from business and consumer surveys [confidence index (industrial production, construction output, retail sales, services output, or consumers) or balance on a survey question], and ε is the stochastic disturbance term, which is assumed to be iid.

In addition to the benchmark model (AR (12)), ten alternative models are estimated. These models are based on indices constructed from answers to individual questions in surveys of consumer and business confidence. There are seven questions in the monthly industry survey. These questions are presented in the succeeding data. In addition to these seven questions, the Industrial Confidence Index, Economic Sentiment Index, and a proxy for the Business Conditions Index, are used in some of the models shown.

Alternative models

Model	
0	Benchmark model, AR (12), Eq. (1) without the variable S
	Models 1 through 10 include one additional variable, in addition to AR (12)
1	Q1. How has production developed over the past 3 months (increased, unchanged, decreased)?
2	Q2. Current overall order books (above normal, normal for the season, below normal)
3	Q3. Current export order books (above normal, normal for the season, below normal)
4	Q4. Current stock of finished products (above normal, normal for the season, below normal)
5	Q5. How do you expect production to develop over the next 3 months (increase, unchanged, decrease)?
6	Q6. How do you expect selling prices to change over the next 3 months (increase, unchanged, decrease)?
7	Q7. How do you expect firm's total employment to change over the next 3 months (increase, unchanged, decrease)?
8	Business Conditions Index,[a] (Q1 + Q2 + Q3 + Q5 − Q4)/5
9	Industrial Confidence Indicator, (Q2 + Q5 − Q4)/3
10	Economic Sentiment Indicator, ESI (weighted average of 15 components in industry (3), services (3), consumers (4), construction (2), and retail trade (3) confidence indicators)

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[6] The model that is used in testing the significance of survey results is very similar to the one used by Deitz and Steindel (2005).

[7] Year-on-year growth is called "annual growth" by Eurostat.

[8] In contrast to the U.S., data on consumer expenditures are not available monthly in the European Union.

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[a] This is a variable constructed by us, and not to be confused with the Business Conditions Index released regularly by the European Commission for the euro area, though the same variables are used.