WHAT DO BUSINESS SENTIMENTS SIGNAL: GROWTH OR NOTHING?

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Abstract

Business sentiment surveys are conducted to provide information on the economic agents' perceptions of the current situation and future expectations, hence the economic growth. Therefore, this paper aims to test whether there is a long term relationship between the business sentiment index and growth in the selected countries over 1985-2009. Besides, the survey questions are decomposed according to their forward-looking and backward-looking characteristics in order to compute "current conditions" and "expectations" sub-indices. ARDL model results indicate that business sentiment indices have a long term relationship with the growth in most of the countries. Nevertheless, there is not a significant difference between "current conditions" and "expectations" sub-indices.

Key words: *Business tendency surveys, business sentiment, growth, ARDL*

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1. INTRODUCTION

Even though the consumer confidence index has been widely discussed in the literature, the business sentiment indices drew attention only during recent decades. It is important to study both indices since the perceptions of demand and supply side of the market do not convey the same information.

In general, the business survey results are used to construct composite leading indicators, but the main question should be the link between the growth and indices. As long as the business tendency surveys reveal information and have a value added, there should be a long term relationship between growth and indices. Otherwise, the construction of such an index would be costly, but most importantly send false signals to market agents.

Hansson et al. (2005) consider Swedish Business Tendency Survey, which is conducted over 7000 different firms. They find that the business tendency survey results inserted in the Dynamic Factor Model based VAR equations outperform other models to forecast the growth rates. Particularly, the forward-looking survey data performs better. Abberger (2007) examine the German quarterly GDP growth and business survey results provided by the Ifo Institute. Comparison of the principal components analysis and subset selection procedure to forecast growth indicates that for quarterly based data subset selection procedure works better whereas the principal components analysis

outperforms on a yearly basis. Taylor and McNabb (2007) also find the significant forecasting power of business confidence indices to predict economic activity for France, Italy, the Netherlands and the UK. Other studies using various procedures also verify that the business tendency surveys are helpful to predict future growth rates in different countries, such as Switzerland (Siliverstovs, 2009), China (Mehrotra and Rautava, 2007) or all European Union countries (Lemmens et al., 2008, 2005).

This study aims to test the link between business tendency surveys and growth in various countries by adopting ARDL (Autoregressive distributed lag) method. This study has three distinct features: First, the information content of the confidence indices is handled from the supply side rather than the consumer side. The difference between the demand and supply sides is crucial because consumer confidence has a direct impact on growth via the consumption channel whereas producers influence via the production channel. Therefore, as evaluating confidence and business indices the separation of two channels have to be clearly stated. Second, the main aim of this paper is to investigate a long term relationship between the production index and growth rather than to find the best forecasting method. In case of a long term relationship, this would necessitate to include the impact of business sentiment in macroeconomic modelling. The clarification of the aim is necessary in order to select the right methodology. To illustrate; Lemmens et al. (2008) examine a similar data set by adopting spectrum analysis so that they are able to link the results with the frequency of surveys. Third, the sub-indices of business sentiments are calculated by using the original survey data. Even though some studies use expectations indices already published by institutions, this study uses the raw data to compute standardized sub-indices. The survey questions provided by the Directorate General for Economic and Financial Affairs (DG ECFIN) are decomposed into "current conditions" and "expectations" sub-indices depending on their contents. Specifically, the questions, which are specifically asking the expectations over the following months, are evaluated under "expectations" sub-index. As far as our knowledge no other study has computed these sub-indices to test which sub-index would have a significant relation with the growth. It is expected to observe a significant relation between the growth and the expectations sub-index whereas a weaker or insignificant relation is expected between growth and current sub-index.

This paper is organized as follows: Part II explains the data set. Part III gives brief information about the methodology. Part IV discusses the empirical results and Part V concludes.

2. DATA

The industrial production indices of countries are provided by Eurostat, and business sentiment surveys are gathered from the DG ECFIN over 1985:1-2009:12. Only for Turkey's business sentiment index the survey information is taken from the Central Bank of Turkey. A list of countries and the time periods are listed in Table 1.

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Table 1. List of Countries

Country Name	Start Date	End Date
Belgium	1985:1	2009:11
Denmark	1998:1	2009:11
Germany	1985:1	2009:11
Spain	1987:4	2009:11
France	1990:1	2009:11
Lithuania	1998:1	2009:11
Luxemburg	1985:1	2009:10
Hungary	2000:1	2009:11
Netherlands	1995:1	2009:11
Poland	1998:1	2009:11
Portugal	1995:1	2009:11
Romania	1993:7	2009:11
Slovenia	1998:1	2009:11
Sweden	1996:1	2009:11
United Kingdom	1985:1	2009:11
Turkey	2000:1	2009:11

For all countries (excluding Turkey) main confidence indicator and 7 questions are reported monthly whereas other 9 questions are collected quarterly. For Turkey the business sentiment index is reported monthly, and the change in the content of survey in January 2000 is also taken into account as forming the sub-indices. Because this study focuses on the link between the monthly industrial production index and business confidence indices, quarterly data is not considered; only the monthly data set is examined. Besides, within the survey questions "current conditions" and "expectations" sub-indices are created in order to test whether the current economic environment evaluations or expectations about future have a significant impact on economic growth. In order to form such sub-indices, only countries with full data set are examined. Before calculating the indices the data is seasonally adjusted by tramo/seats. Table 2 shows the questions of the survey and calculation of the sub-indices. Arithmetic average of answers are used to calculate sub-indices. Nevertheless, in complex index calculations the denominator and numerators are multiplied with some parameters derived from the sample. Even though the "current conditions" and "expectations" sub-indices lack of these parameters, a simple method is followed to decompose the composite index.

Table 2. Business Sentiment Indices

Monthly Questions for all countries except Turkey

	Confidence Indicator	= (Q2-Q4+Q5) / 3
1	Production trend observed in recent months	
2	Assessment of order-book levels	
3	Assessment of export order-book levels	
4	Assessment of stocks of finished products	
5	Production expectations for the months ahead	
6	Selling price expectations for the months ahead	
7	Employment expectations for the months ahead	
	Current Situation Index	= (Q1+Q2+Q3+Q4) / 4
	Expectations Index	= (Q5+Q6+Q7) / 3

Monthly Questions for Turkey

1	General condition compared to last month	
2	Export conditions' expectations for 3 months ahead	
3	Investment expenditure expectations for 12 months ahead	
4	Assessments of total number of orders in the current month	
5	Assessment of finished goods stocks' level in the current month	
6	Employment expectations for 3 months ahead	
7	Production expectations for 3 months ahead	
8	Assessments of sales to domestic market over last 3 months	
9	Assessments of raw material stocks' level over last 3 months	
	Current Situation Index	= (Q1+Q4+Q5+Q8+Q9) / 5
	Expectations Index	= (Q2+Q3+Q6+Q7) / 4

3. METHODOLOGY

Previous literature on the business sentiment surveys found that the business sentiment indices can be used to forecast future growth rates. In order to test whether there is a long term relationship between the business sentiment indices and the growth, ARDL approach of Pesaran and Pesaran (1997) and Pesaran, Shin and Smith (2001) is employed. Because ARDL method has several advantages over the other cointegration procedures, following model is constructed to test the presence of cointegration between growth and business sentiment indices:

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$$\Delta BSI_{t,i} = a_{0,BSI,i} + \sum_{j=1}^{n} b_{j,BSI,i}\Delta BSI_{t-j} + \sum_{j=0}^{n} c_{j,BSI,i}\Delta IP_{t-j} + \lambda_{1,BSI}BSI_{t-1,i} + \lambda_{2,BSI}IP_{t-1,i} + \varepsilon_{1,t,i}$$

(1)

$$\Delta IP_{t,i} = a_{0,IP,i} + \sum_{j=0}^{n} b_{j,IP,i}\Delta BSI_{t-j} + \sum_{j=1}^{n} c_{j,IP,i}\Delta IP_{t-j} + \lambda_{1,IP}BSI_{t-1,i} + \lambda_{2,IP}IP_{t-1,i} + \varepsilon_{2,t,i}$$

(2)

where BSI refers the business sentiment index and IP demonstrates the monthly industrial production index of country i. The short run coefficients are b, c whereas λs are the long run coefficients. The null hypothesis of $\lambda_1 = \lambda_2 = 0$ implies that the long run coefficients drop from the equations, i.e., there is no cointegration. In order to test this hypothesis the F-statistics is compared with the critical values of Narayan (2005) because the sample size is a maximum of 299 (from 1985:1 to 2009:11). On the other hand, Pesaran and Pesaran (1997) and Pesaran, Shin and Smith (2001) provide critical values for sample sizes of 500. Unless there is not a cointegration relation between BSI and IP, ARDL procedure estimates $(m+1)^{k+1}$ number of regressions, where m is the maximum lag length and k is the number of variables. After determining the lag length given k is equal to 2, both the long run relationship and the error-correction representation of the selected ARDL model can be estimated. Assuming that the industrial production index is the forcing variable of the business sentiment index, the long run relation between BSI and IP would be an ARDL(h,z) model as follows for country i:

$$BSI_{t,i} = a_{0,BSI,i} + \sum_{j=0}^{h} \phi_{j,BSI,i}BSI_{t-j} + \sum_{j=0}^{z} \varphi_{j,BSI,i}IP_{t-j} + \omega_{1,t,i}$$

(3)

After calculating the current and expectations sub-indices, same model given in Equations 1, 2 and 3 are re-estimated by replacing BSI with sub-indices. Nevertheless, this study concentrates on the bounds-testing procedure results (i.e., F-statistics results) because the main concern is to test whether there is a long run relationship between the BSI and IP, and if so, to determine which sub-index performs better.

4. EMPIRICAL RESULTS

One of the most important advantages of ARDL is that there is no requirement of same order of integration as in other cointegrating procedures[1]. Therefore, Equations 1 and 2 are directly estimated[2] and the F-statistics results are given in Table 3[3].

According to the BSI results, there is a bi-directional link between the BSI and IP in 5 out of 16 countries (Denmark, Spain, France, Sweden, and the UK). In 4 countries (Belgium, Germany,

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[1] The unit root tests are available upon request.
[2] For each country the lag length is selected based on the Schwarz Information Criteria.
[3] Because here the basic concern is to test the long run relationship and compare performances of sub-indices, estimation of long run relation and error-correction representations of ARDL model are not reported here. Results are available upon request.

Luxemburg, and the Netherlands) IP is the forcing variable whereas in 2 countries (Lithuania and Slovenia) BSI is the forcing variable. On the other hand, for the other countries (Hungary, Poland, Portugal, Romania, and Turkey) there is not a cointegration between BSI and IP. Nevertheless, there are some studies finding evidence for a cointegration relation in these countries[4]. Therefore, in general the results on BSI and IP partially support the previous findings due to the different definitions of growth (GDP, industrial production index, etc.), surveys and time period, but at least for 11 out of 16 countries there is a link between the growth and business sentiment surveys supporting the general findings.

Table 3. Bounds-Testing Procedure Results

Country	Cointegration Hypotheses	F-statistics BSI	F-statistics Current	F-statistics Expectations
Belgium	$F(IP_{t,i}|BSI_{t,i})$	4.9977	3.8436	6.0236**
	$F(BSI_{t,i}|IP_{t,i})$	6.5845**	10.9147***	12.6279***
Denmark	$F(IP_{t,i}|BSI_{t,i})$	6.6209**	6.2038**	8.8172***
	$F(BSI_{t,i}|IP_{t,i})$	5.5548*	3.8022	2.0940
Germany	$F(IP_{t,i}|BSI_{t,i})$	3.4567	1.5754	4.3441
	$F(BSI_{t,i}|IP_{t,i})$	11.3518***	7.5034**	10.5152***
Spain	$F(IP_{t,i}|BSI_{t,i})$	5.2919*	4.8236	4.5923
	$F(BSI_{t,i}|IP_{t,i})$	7.3494**	2.5954	2.9722
France	$F(IP_{t,i}|BSI_{t,i})$	7.9325**	1.9540	1.6475
	$F(BSI_{t,i}|IP_{t,i})$	6.2358**	10.1920***	6.1147**
Lithuania	$F(IP_{t,i}|BSI_{t,i})$	5.2165*	3.9498	2.8209
	$F(BSI_{t,i}|IP_{t,i})$	1.5431	1.2919	1.8643
Luxemburg	$F(IP_{t,i}|BSI_{t,i})$	1.6763	1.6563	2.0614
	$F(BSI_{t,i}|IP_{t,i})$	5.5598*	6.7559**	5.3290*
Hungary	$F(IP_{t,i}|BSI_{t,i})$	2.3139	1.0864	1.8094
	$F(BSI_{t,i}|IP_{t,i})$	3.3000	1.0811	3.7379
Netherlands	$F(IP_{t,i}|BSI_{t,i})$	1.6649	1.5113	1.3134
	$F(BSI_{t,i}|IP_{t,i})$	5.4200*	7.1706**	3.9951
Poland	$F(IP_{t,i}|BSI_{t,i})$	0.0590	0.1227	0.0317
	$F(BSI_{t,i}|IP_{t,i})$	2.5774	1.0704	1.7119
Portugal	$F(IP_{t,i}|BSI_{t,i})$	3.0649	3.1442	3.1032
	$F(BSI_{t,i}|IP_{t,i})$	2.7618	3.2913	4.6270
Romania	$F(IP_{t,i}|BSI_{t,i})$	0.4217	0.4588	2.6996
	$F(BSI_{t,i}|IP_{t,i})$	3.9456	4.3895	5.6339*
Slovenia	$F(IP_{t,i}|BSI_{t,i})$	5.6882*	3.7444	5.4259*
	$F(BSI_{t,i}|IP_{t,i})$	4.2657	3.9666	4.2386
Sweden	$F(IP_{t,i}|BSI_{t,i})$	9.0765***	9.0267***	10.6870***
	$F(BSI_{t,i}|IP_{t,i})$	5.8877*	4.4000	6.0407**
United Kingdom	$F(IP_{t,i}|BSI_{t,i})$	8.3047***	3.8598	5.2866*
	$F(BSI_{t,i}|IP_{t,i})$	6.9843**	4.4668	7.8977**
Turkey	$F(IP_{t,i}|BSI_{t,i})$	3.9126	5.4783*	2.4927
	$F(BSI_{t,i}|IP_{t,i})$	4.3429	4.2513	5.3665*

Notes: ***, **, * denote 1%, 5% and 10% significance, respectively. F-statistics critical values are from Pesaran, Shin and Smith (2001). For each row, i denotes the corresponding country. Narayan (2005) critical values under unrestricted intercept and no trend specification are 4.135-4.895, 5.060-5.930 and 7.095-8.260 for 10%, 5% and 1% significance, respectively.

Comparing the "current conditions" and "expectations" sub-indices, for only 5 countries (Belgium, Romania, Slovenia, Sweden, United Kingdom) there is an improvement in the F-statistics whenever BSI is replaced with the "expectations" sub-index. Especially, for Romania industrial

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[4] To illustrate; Belke et al. (2009) find that sentiments play an important role for Hungary and Poland.

production index becomes the forcing variable for the expectations sub-index whereas there is no cointegration between BSI and IP. On the other hand, for most of the countries (9 out of 16) the use of current or expectations sub-index does not significantly matter. Only for the Netherlands, use of current sub-index increases the F-statistics so that industrial production index becomes the forcing variable of the current sub-index. Turkey's results are controversial, but considering that there is no cointegration between IP and BSI these results have minor importance. In general, the results refute the expectation to find an improvement with the expectations sub-index.

5. CONCLUSION

Even though consumer confidence indices have been widely studied, business tendency surveys have also valuable information to reflect the production side of the economy. This paper aims to understand whether there is a long run relationship between the business tendency surveys and industrial production index in selected countries over 1985-2009. Besides, the survey questions are decomposed according to their forward looking and backward looking characteristics in order to compute "current conditions" and "expectations" sub-indices. ARDL model results indicate that business sentiment indices have a long term relation with the growth in most of the countries. Nevertheless, there is not a significant difference between "current conditions" and "expectations" sub-indices. The results suggest that the business sentiment indices convey valuable information on the economy's growth. Even though expectations about future economic prospects seem to motivate the surveys, both backward looking and forward looking questions are in relation with the growth, no one performing better than the other.

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