LATVIAN CONFIDENCE INDICATORS AS THE OPERATIVE INDICATORS OF SECTOR DEVELOPMENT

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INTRODUCTION

Business surveys form part of the broad range of information available on the current economic situation and its short-term prospects. The information contained in surveys relates to various aspects of a firm's operations, such as sales, stocks, order books, selling prices, employment etc. Survey data are released quite quickly and the forward-looking nature of many of the survey questions suggests that they might be useful in providing information on how various aspects of the economy are expected to evolve in the short-term time perspective. On the other hand, survey responses are generally qualitative, rather than quantitative, therefore making interpretation of the results quite difficult.

This paper seeks to establish how the myriad of information contained in the main national business surveys might be used in a systematic way. Section 1 discusses the advantages and disadvantages of business survey data, and in the process, outlines how the results are aggregated and the issues associated with interpreting these results. Section 2 details the main business surveys for Latvia. Section 3 introduces tests that focus on how well the various business survey measures are correlated with actual economic variables and whether the survey measures provide any information in addition to that provided by past values of the economic variables. The results of the tests are detailed in Section 4.

1. THE ADVANTAGES AND DISADVANTAGES OF BUSINESS SURVEY DATA

Business surveys potentially provide quite timely information about the current state of the economy, as a number of the survey indicators, such as sales and output, appear to move contemporaneously with economic activity. The survey information has direct parallels in official statistical series but it is released relatively quickly – early in the quarter to which the information pertains. In contrast, official data are released with a longer lag because of the large amount of information that has to be collected. National accounts data, for example, are released approximately two months following the end of the quarter.

Expectations about important economic variables may also be important if they lead economic developments in a systematic way. For example, expectations of sales and selling prices are likely to affect investment decisions taken by firms. Thus the business surveys are potentially quite useful for judging the outlook for the economy. Combinations of responses may also be enlightening. For example, divergences in responses between actual and expected business conditions (or confidence), or between actual sales and new orders, may provide clues as to whether a movement in inventories is intended or unintended. Survey-based measures of business inflationary expectations may also be used to derive various measures of short-term real interest rates.

At the same time, all statistical series are based on samples of firms, households or individuals, rather than a complete enumeration. Thus business surveys are subject to a number of possible sources of error. Sampling error, which arises as a result of the use of a sample rather than a census, is one source of error. Moreover, adjustments can be made to results using standard statistical techniques (for example, responses from a particular industry may be weighted by that industry's share in total

output). Other sources of error, however, are more subtitled and are difficult to quantify. These relate to issues of survey design such as the ordering of survey questions, the medium of interview, the length of time in a survey and the incentives to respond accurately. These factors can introduce a bias to survey results.

In contrast to most official series, business surveys predominantly provide qualitative, rather than quantitative responses to survey questions, so as to make completing the form easier and faster for respondents. For example, respondents usually nominate an increase, decrease or unchanged result for a particular variable (some surveys use up/down or good/poor, while others have gradations within 'increase' and 'decrease'). Even when respondents are asked to provide quantitative responses, this usually takes the form of nominating a given range for a variable.

Summary statistics are typically used in business surveys to convey the information contained in the qualitative responses. The net balance statistic is used for these purposes, measuring the difference between the proportion of firms reporting an improvement in an area and those reporting deterioration; the net balance statistic allows the presentation of a single figure as a summary of responses to each question. Positive balances tend to be associated with growth in the variable of interest, while negative balances tend to be associated with declines in the variable of interest.

The net balance statistic, however, needs to be used carefully as it is not always clear how firms are reporting their individual experiences. Firms reporting an increase in sales, for example, may be referring to either above-trend growth in sales, or strictly positive growth in sales. If all respondents are reporting relative to an increasing trend over time, then the numbers reporting 'increasing' or 'decreasing' should be roughly equal when growth is around trend. However, if some respondents are reporting relative to zero, then when growth is around trend the share reporting 'increasing' will be greater than the share reporting 'decreasing', suggesting that there may be a positive bias. In order to overcome this type of bias, the simplest adjustment is to refer to the net balance statistic in relation to its long-run average. It should be noted, however, that this adjustment implicitly assumes that the bias does not change over time, whereas in practice it may well do. Reporting of the net balance statistic can also be confusing. Falls in the level of activity are sometimes inferred from negative net balance statistics, whereas negative net balance statistics can be consistent with positive rates of growth, albeit below trend.

2. BUSINESS SURVEYS IN LATVIA

The main business surveys in Latvia with a reasonably long history are as follows:

- Industry business survey;
- Retail trade business survey

Industry business survey and retail trade business survey could be viewed as representatives of the goods and services sectors of the economy, respectively. The most important features of these surveys are discussed below.

2.1. Industry Business Survey

The first business survey in Latvia was conducted in the industrial sector, in 1993. In the period from 1993 to 2001, the surveys were conducted once a quarter, but starting from April 2001 the surveys are carried out every month. Since 1993, the questions included in the surveys have been significantly modified. Namely, the questions that are used in surveys in the EU states have been included in the surveys, while the questions that are less relevant have been excluded from the surveys or updated accordingly. The surveys have been updated by inclusion of questions on the sufficiency of overall order books, changes in competitive position on the domestic and foreign markets, evaluation of financial position of the enterprise.

The industry business survey covers the entire industrial sector: manufacturing, mining and quarrying, and the energy sector. In 2004, the survey sample included 700 enterprises, which accounted for slightly less than 15% of the economically active enterprises in the industrial sector (for almost 93% of large enterprises, almost half of medium enterprises and a little more than 8% of small enterprises).

It is useful first to briefly describe the relationship between the industry confidence indicators, which are analysed in this study[2] and the overall trends in the economy. By their economic nature, the industry confidence indicators can be grouped into several clusters. For example, such industry confidence indicators as *Production activity*, *Status of the order books*, *Production capacity* mainly reflect domestic demand trends, while the indicator *Status of the export order books* certainly characterises changes in the foreign demand. The indicators *Production capacity* and *Status of the stock of finished goods* are affected by aggregate (both domestic and foreign) demand. Growth of s*tocks of finished goods* can also cause a short-term fall in prices.

Box plot 2.1

Indicators of the industry business survey

- Production activity over the past 3 months (tendency);
- Current status of the order books (level);
- Current status of the export order books (level);
- Current status of the stock of finished products (level);
- Expected production development over the next 3 months (tendency);
- Expected selling prices over the next 3 months (tendency);
- Expected employment over the next 3 months (tendency);
- Current production capacity taking into account the expected demand over the coming months (level);
- Production assurance by current overall order books, in months (level);
- Expected development of orders over the past 3 months (tendency);
- Expected development of export orders over the next 3 months (tendency);
    - total;
    - to EU states;
    - to CIS;
- Currently operating capacity (as a percentage of full capacity);
- Development of the competitive position over the past 3 months (tendency);
    - on the domestic market;
    - on the external market (EU states);
    - on the external market (non-EU states);
- Development of the financial position over the past 3 months (tendency)

An increase in demand should positively affect both production and realisation processes, therefore, one should expect a positive correlation between the respective statistical indicators and the confidence indicators that are affected by changes in demand. According to the economic theory, an increase in demand leads to higher prices. Moreover, higher demand for industrial products calls for increased output and employment. Furthermore, the confidence indicator *Expected employment* should be positively correlated with actual employment in the industrial sector. An increase in employment produces an upward pressure on the production costs (via wages), which leads to an increase in the producer prices.

2.2. Retail Trade Business Survey

The retail trade business surveys have been conducted in Latvia since 1996. Until the end of 2001, the surveys in the retail trade sector were conducted on the quarterly basis, during the first month of every quarter. Starting from 2002, the surveys are carried out once a month. In May 2003, some questions were updated and adjusted according to the Joint Harmonised EU Programme of Business and Consumer Surveys.

[2] The confidence indicators, which are available only from 2001, were not included in this study, because of insufficiently long data series.

In 2004, the retail trade business survey sample included 506 enterprises, which accounted for approximately 5% of the total number of enterprises in the retail trade sector (including 82% of large enterprises, 27% of medium enterprises and 3% of small enterprises).

Box plot 2.2

Indicators of the retail trade business survey

- Development of business activity (sales) over the past 3 months (tendency);
- Expected development of business activity (sales) over the next 3 months (tendency);
- Current status of the volume of stocks (level);
- Expected change in orders placed with suppliers over the next 3 months (tendency);
- Expected change in employment over the next 3 months (tendency);
- Development of selling prices over the past 3 months (tendency);
- Expected change in selling prices over the next 3 months (tendency);
- Current financial position (level);
- Development of the competitive position on the trade sector over the past 3 months (tendency)

Like the industrial confidence indicators, the retail trade confidence indicators can be grouped into several clusters, according to their relationship with the main macroeconomic indicators. Thus, such retail trade confidence indicators as *Business activity*, *Employment*, *Volume of stocks of finished goods* and *Financial position* are expected to be strongly correlated with the sector's value added. The confidence indicator *Expected employment* should be positively correlated with actual employment in the trade sector. Stronger competition in the sector, growth of stocks of finished goods and a decline in employment can cause a lowering of prices.

3. EVALUATING THE LEVEL OF INFORMATION OF BUSINESS SURVEYS

Evaluation of the relationship between business survey indicators and economic variables can be obtained in several ways:

- by examining the pair-wise correlation coefficients of the business survey indicators with selected economic variables [3, 4, 5];
- by adding survey information to a simple autoregressive model of an economic variable [6].

Correlation coefficients measure the degree of association between two variables. In the work that follows, correlation coefficients are measured over a common sample period (1997-2004). The main appeal of correlation coefficients is that they provide a simple rule of thumb for judging the usefulness of a survey variable. However, they have limited predictive ability relative to regression-based techniques.

An alternative approach is to add survey information to an autoregressive model of an economic activity variable. This allows us to examine whether the survey outcomes tell us any more about the economic activity variable than lags of the variable itself. To do this, we consider the following autoregressive model:

$$\Delta ER_{it} = \alpha_{i0} + \sum_{j=1}^{4} \alpha_{ij} ER_{it-j} + \beta_i KR_{it} + u_{it},$$

where ΔER refers to the quarterly growth rates of selected economic indicators, KR - refers to the level of the net balance (relative to its long-run average), i – refers to the corresponding business survey confidence indicator.

The above-mentioned autoregressive model focuses on *actual* or *expected* trends in business conditions for the current quarter. From a forecasting perspective, both offer advantages in terms of

timeliness. The results of the tests are informative in a number of ways. First, a statistically significant survey variable implies that the survey indicator provides information in the estimation of the economic variable in addition to the variable's own history. Second, the coefficient on the survey variable, if significant, indicates the sensitivity of the quarterly growth rate of the economic variable to a one-unit change in the survey variable (all other variables remaining constant). This is, of course, a minimum test since there may be other variables, which perform as good a role as the business sentiment indicator and be just as timely.

4. RESULTS

The information based on the Industry and Retail trade business surveys is examined in this section. Correlation coefficients and results from the autoregressive model are discussed below.

4.1. Industry Confidence Indicators vs. Industry and the Entire Goods Sector Statistical Indicators

The correlation coefficients listed in Table 4.1 suggest that *industry composite confidence indicator* as measured in Industry business survey is positively correlated with year-on-year growth in all selected statistical indicators of industry and the economy as a whole, employment and producers price index development. However, much stronger correlation with yearly growth in all selected indicators demonstrates confidence indicator *Production activity over the past 3 months*. The correlation is quite close in all cases except employment tendencies in industry, for which indicator *Expected change in total employment over the next 3 months* shows better results. Survey respondents are asked to report in both 'actual' and 'expected' terms. On the whole, the actual series have slightly higher correlation coefficients than the expected series. Table 4.2 details the results based on the simple autoregressive model. This tests whether survey measures of confidence explain, at a statistically significant level, development of the goods sector and total value added, employment in industry and PPI in the period in which the observation was taken. All survey measures of confidence that are significant are listed in the table.

Table 4.1. Correlation coefficients

	Production volume		Production realization		Value added in constant prices			Employment		PPI
	Industry	Manufacturing industry	Industry	Manufacturing industry	Manufacturing industry	Goods sector	Total	Industry	Manufacturing industry	
Industry composite confidence indicator	0.57	0.60	0.61	0.63	0.61	0.64	0.64	0.62	0.62	0.63
Production activity over the past 3 months	**0.83**	**0.85**	**0.86**	**0.87**	**0.84**	**0.86**	**0.81**	0.54	**0.84**	**0.83**
Current status of the stocks	-0.54	-0.59	-0.57	-0.62	-0.60	-0.62	-0.66	-	-	-0.62
Current status of the order books	0.58	0.58	0.61	0.61	0.56	0.63	0.59	0.58	0.56	0.65
Current status of the export order books	0.60	0.62	0.64	0.66	0.63	0.69	0.67	0.63	0.62	0.65
Current production capacity	0.57	0.58	0.56	0.57	0.56	0.59	0.57	-	-	0.58
Expected development of production	0.45	0.46	0.45	0.45	0.46	0.50	0.42	0.40	0.41	0.48
Expected development of export orders	0.45	0.48	0.42	0.44	0.50	0.48	0.42	0.46	0.47	0.35
Expected change in selling prices	-	-	-	-	-	-	-	-	-	0.31
Expected change in total employment	-	-	-	-	-	-	-	**0.65**	0.63	0.75

Table 4.2. Significance of survey indicators in explaining corresponding statistic variables

Confidence indicator	Coefficient	t-statistics	LM(1) [(a)]	LM(1-4) [(a)]
			p-value	
Goods sector value added in constant prices				
Industry confidence indicator	0.156	2.356**	0.007	0.117
Production developed over the past 3 months	0.203	3.022***	0.307	0.105
Current status of the overall order books	0.096	2.547**	0.206	0.629
Current status of the overall export order books	0.129	2.546**	0.017	0.206
Expected production development over the next 3 months	0.146	2.043**	0.027	0.135
Total value added in constant prices				
Industry confidence indicator	0.080	2.158**	0.324	0.254
Production developed over the past 3 months	0.116	3.630***	0.239	0.116
Current status of the overall order books	0.040	1.935*	0.915	0.533
Current status of the overall export order books	0.062	2.235**	0.679	0.360
Employment in industry				
Expected change in total employment over the next 3 months	0.235	2.904***	0.635	0.543
PPI				
Expected change in selling prices over the next 3 months	0.065	3.654***	0.255	0.126

***, ** and * indicates significance at 1, 5 and 10 per cent levels.
[(a)] LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

4.2. Retail Confidence Indicators vs. Trade and the Entire Services Sector Statistical Indicators

The correlation coefficients listed in Table 4.3 suggest that Retail trade confidence indicator as measured in Retail trade business survey is poorly correlated with year-on-year growth in all selected indicators of trade activity, employment and consumer's price index. In some cases the correlation coefficients are very small and even of the opposite sign, which indicates a very low informative value of the examined business survey. Table 4.2 details the results based on the simple autoregressive model. Because of the very poor information contained in the Retail trade business survey only the confidence indicator *Expected change in selling prices* explains, at a statistically significant level, CPI development in the period in which the observation was taken. In other words, only this confidence indicator at present time provides information useful in the estimation of the economic variable in addition to the variable's own history.

Table 4.3. Correlation coefficients

	Value added at constant prices			Employment	CPI
	Trade sector	Services sector	Total		
Retail trade composite confidence indicator	0.25	-0.22	0.06	-0.31	0.16
Development of business activity over the past 3 months	0.04	0.07	0.32	-0.55	-0.11
Development of selling prices over the past 3 months	-	-	-	-	0.43
Development of the competitive position over the past 3 months	-	-	-	-	0.24
Current status of the volume of stocks	-0.20	0.11	0.08	-	-0.47
Current financial position	**0.53**	-0.19	0.17	-	-
Expected development of business activity over the next 3 months	0.12	-0.41	-0.43	0.46	-
Expected change in orders over the next 3 months	0.10	**-0.70**	**-0.57**	0.26	0.10
Expected change in employment over the next 3 months	-	-	-	-	0.11
Expected change in selling prices over the next 3 months	-	-	-	**0.48**	**0.57**

Table 4.4. Significance of survey indicators in explaining corresponding statistic variables

Confidence indicator	Coefficient	t-statistics	LM(1) [(a)]	LM(1-4) [(a)]
			p-value	
CPI				
Expected change in selling prices over the next 3 months	0.021	2.718***	0.595	0.065

***, ** and * indicates significance at 1, 5 and 10 per cent levels.
[(a)] LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

CONCLUSIONS

Business surveys in overall provide a potentially useful source of information about the economy. They benefit from being released well ahead of comparable official statistics. In some cases they could fill in gaps in the official statistics and may provide a different perspective on an issue. However, care needs to be taken in using the information in business surveys. They are subject to a number of possible sources of measurement error. Moreover, much of the information is qualitative and therefore needs to be summarized in the form of a net balance statistic, which can be difficult to interpret.

Looking at the performance of the Industrial and the Retail trade business survey indicators over the past seven years, the following conclusions could be drawn:

- in terms of information on the current state of the economy, the Industrial business survey series provide useful information about developments in key macroeconomic variables;
- the Retail trade business survey is not informative at the given stage with the only exception of selling prices. This outcome could be explained by the ongoing process of restructuring in the trade sector that has a significant influence on the retail trade functioning and scales down the ratio of gray economy in the trade sector.

Summarizing, the Industrial business survey series could be viewed as a useful operative source of information for the short-term forecasting of important economic development statistical indicators. The Industrial business survey series could be used as an instrument both for the expert-decision methods as well as econometric models. The short-term forecasting of other sectors that are closely related to the industry (for example, the *Transport, storage and communications* sector) could benefit as well by involving into the forecasting process the most relevant confidence indicators of the Industrial business survey series.

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