SURVEY ON SURVEY IN THE CZECH INDUSTRY SECTOR

Veronika Ptáčková, Jiří Novák[1]

Abstract

These are uncertain times. Economists and politicians search for information to show how the economy will develop in the future. Business and consumer surveys are examples of the leading indicators. This paper presents the key findings of the survey on survey in the industry sector in the Czech Republic. The collected answers mean we can (i) better understand the behaviour of our respondents, (ii) modify the future methodology, (iii) and find the clusters of the respondents. Through these changes, the respondents will find the definitions of the economic terms or a recommendation of 'significant change' for the evaluation of the questions. These proposed changes improve the quality of the analysis, which is respectively focused on the business cycle and the economic terms.

Key words: business survey; consumer survey; composite indicator; business cycle; survey

JEL Classification: M2, C8, D22

Introduction

Uncertainty affects us in today's world more than we ever thought. A pandemic that has swept the world has changed the meaning of business and consumer surveys and it is no longer only economists, journalists and the professional public that are interested in the results of the survey.

Everyone is expecting a significant drop in the economy, but the question remains: What kind of drop will it be? Everybody wants to know the answer to this question: small entrepreneurs, factory owners and ordinary citizens. The uncertainty about production and employment is increasing with the length of the constraints. As a result of the mentioned conditions, the pressure on the speed and quality of statistical results is growing — especially for the leading indicators. This is why the Business and Consumer Survey, ifo Business Climate Index and the KOF Index (KOF Swiss Economic Index) are beneficial for users, especially the macroeconomic analysts, microeconomic economists and for economics in general. In the Czech Republic, the leading indicators are collected and calculated using business and consumer surveys, which are harmonised by the European Commission.

1 Literature review

Business and consumer surveys should supplement short-term statistics — quantitative information — and collect the subjective opinions of company leaders on their development, which can help with the prognosis (Marek, Hronová, & Hindls, 2019). Sorić, Škrabić and

[1] Prague University of Economics and Business, Faculty of Informatics and Statistics (veronika.ptackova@vse.cz; xnovj159@vse.cz). The authors are also employees of the Czech Statistical Office.

Čižmešija (2013) add that they can help with making day-to-day decisions on consumption, investments and savings. Consumers and business indicators are also beneficial for making predictions in developing countries (Vázques et al., 2009).

Analysts use business and consumer survey outputs for a vast range of predictions and describing the tendencies in the economy. The indicator development can be used for quantitative macroeconomics forecasts (Oinonen & Paloviita, 2017) or as an alternative source for near-future forecasts in the business sector and for consumers (Claveria et al., 2019). Claveria, Monte and Torra (2020) detected the underlying existing periodicities in indicators and created a filter for extracting components that can be defined as similar to the periodicities that are in the economic activity dynamics. They state the differences between business and consumer indicators — the length predictions in the questions can be the main problem. They used spectral analysis for their findings. Ahmed and Cossou (2016) state that consumers reflect the news during economic expansions in their answers. Claveria (2020) focuses on the effects on the macro data in the three economic indicators: economic, inflation and employment uncertainty (they use industry and consumers answers). As an example, we chose the impact of the changes in economic activity due to the decrease in manufacturing production.

1.1 Business and consumer survey

From previous analyses from across the world, we know that the business and consumer survey is the beneficial data source for information about the confidence in the business sector and consumers. In the Czech Republic, the Czech Statistical Office (CZSO) is responsible for the collection, data processing and publication of the results. At the end of the process, the individual confidence indicator and Economic Sentiment Indicator (ESI) are the main outputs of the survey. According to the survey, information is collected about the current situation and future development in the business sector by asking about prices, demand, production, boundaries, stocks and consumers. They answer questions about their financial situation, product prices and savings (CZSO, 2020). In this article, we focus solely on the business sector.

The survey is conducted every month. The advantage of this survey is it provides qualitative data, which means that respondents usually choose from three options:

- growth,
- stagnation,
- decrease.

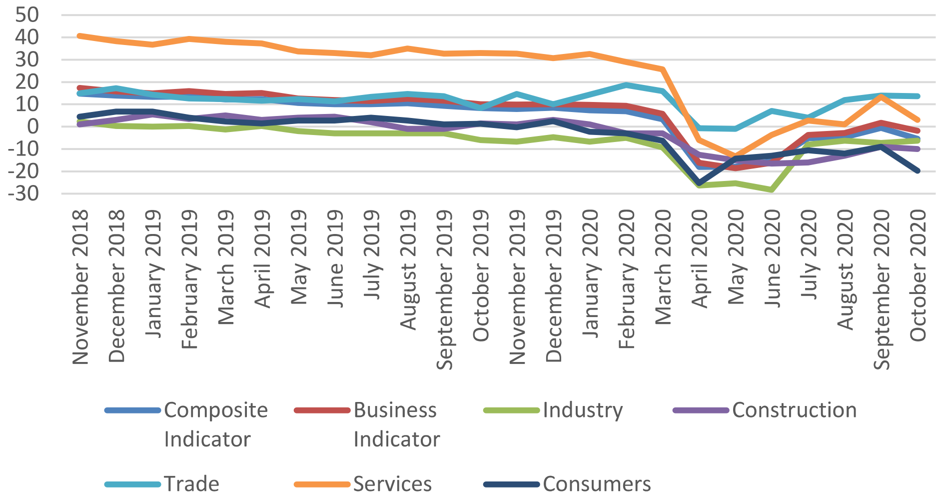
Finally, the individual confidence indicators are calculated for the sectors: industry, construction, trade and selected services. The balance is calculated as the difference between positive and negative responses. It must be mentioned that every sector has a different weight:

- Confidence indicator in industry (40%)
- Confidence indicator in construction (5%)

• Confidence indicator in trade (5%)
• Confidence indicator in selected service (30%)

The business confidence indicator (80%) is calculated from these confidence indicators. When adding the consumer confidence indicator (20%), there is the composite confidence indicator and the economic sentiment indicator (CZSO, 2020). The European Commission (EC) states this weighting scheme because they want to compare the development of the economy across European countries. Figure 1 describes the development of the individual confidence indicators and the composite indicator from November 2018 to October 2020 in the Czech Republic (in the basic indices form). The impact of the uncertainty during the first and the start of the second wave of the pandemic can be observed.

Figure 1 | Business and consumer survey in the Czech Republic (2018–2020, basic indices)



Source: CZSO (2020)

The business and consumer survey has many advantages, for example, speed of publication, a straightforward interpretation and that the answers come from business people. In the Czech Republic, a question is now asked whether the respondents understand the questionnaires. This activity is also a reaction to questions from the primary users (Czech National Bank, Ministry of Industry and Trade, Ministry of Finance of the Czech Republic and commercial banks). Analysts from these institutions use the outputs from business and consumer surveys for their analysis and forecasts. Staff at the CZSO are also asked what the individual outputs mean for them. Unfortunately, the European Commission does not have a definition of economic terms (see chapter Results). Due to the mentioned reasons, we decided to conduct a survey on survey. We started with industry because it is a crucial area of the economy in the Czech Republic. According to the EC (2020, p. 7), 'the industry survey is largely qualitative. The main questions refer to an assessment of recent trends in production, the current levels of order books and stocks, as well as expectations about production, selling prices and employment. In addition, the survey provides quantitative information on a quarterly basis on two variables that are not reported in conventional statistics, namely capacity utilisation and the number of months of production assured.'

The aim of the paper and the research questions are: How do respondents understand the questions in the questionnaire? How do we define the clusters of the respondents in the business and consumer survey?

2 Methods and results

To determine the quality of the business and consumer surveys (and the methodology), we used a survey on survey method, which meant that we prepared a questionnaire that evaluates the information about the monthly survey (we sent the questionnaire to the same respondents who fill in the form every month). The following parts of the chapter will describe the motivation, preparation of the survey and present the elementary results of the respondents' views on specific economic terms. Visualisations are published at the end of the third chapter, which describe the flow of the respondents' answers to individual questions.

2.1 Motivation for the survey on survey

The survey on survey in the industry sector is the first of further surveys of the CZSO.
We plan to identify:

- The definition of the evaluated terms (similarity, differences)
- The impact of the subjectivity and objectivity in the answers
- The respondents' characteristics
- The management quality

These definitions mean we can obtain better predictions of the national and the European Union economies. In the initial preparation, we discussed the complicated questions in the survey with crucial respondents and users. Their responses reveal that many respondents do not understand the economic terms in the questionnaire — they have a different meaning for each economic term. The respondents included banks, ministries, the Czech National Bank and analysts who comment on the economic situation for newspapers or magazines. We collected the remarks and prepared a questionnaire about business and consumers surveys. CZSO and the Faculty of Informatics and Statistics at the Prague University of Economics and Business organised this survey on survey. The survey took place at the end of 2019.

2.2 Survey on survey results

We prepared the questionnaire, which has 19 questions primarily focusing on the meaning of the evaluation of the economic indicators. This chapter presents the chosen items and responses to them. These outputs from the survey on survey are compared with the recommendation from the European Commission or the understanding of our users.

CZSO recommends using the order book for the estimation of the level of overall demand for production in the questionnaire. Our respondents answered if they used this source of data or not with 23.8% of respondents answering yes; 33.8% agree with this source; 6.7% do not use this source and 14.3% use another one. A fifth of the respondents (21.4%) do not use any data source. They answered the question about the production demand due to their subjective feeling.

We then asked what data source they use when they are evaluating future production: 47.8% of respondents use the order book while 21.1% use another data source. They mention the forecast for the next quarter, SAP, direct orders from customers, reporting from management accounting, the corporate information system and the production plan. The rest of the respondents use their subjective feeling for answering.

We then discuss what the economic indicators mention for Czech respondents in the industry sector. The evaluation of the overall economic situation in the company was for the first term. The respondent could choose from multiple answers.

The respondents evaluated the financial situation in the company as the most important (81.9%). The results correspond with the Polish survey on survey, which presents the same results (Stefaniak, 2016). The respondents (56.2%) evaluated the production demand as the second most important. These responses are helpful because it enables us to visualise what the balance or basis index should predict (describe) in our analysis.

Table 1 | Overall economic situation (%)

	%
The financial situation in the company	81.9
Production demand	56.2
Market competitiveness	21.4
Overall economic situation in the sector	20.0
The number and qualification of employees	10.9
The development of the global economy	6.2
The general economic situation in countries which are the company's business partners	5.2
The general economic situation in the national economy	3.8
Other	0.9

Source: Authors' own processing
Note: Respondents could mark multiple answers, so the sum does not add up to 100%.

Secondly, we asked respondents what production (in the past or future) meant to them. They choose from three options:

- natural production – 35.9%
- sales/total revenue – 61.2%
- other – 2.9%

In the 'other' choice, they mentioned sales and production together, the quantity of the contracts or the number of working hours.

Capacity utilisation is another confusing term for Czech respondents. We think that the meaning of this term will be re-evaluated in the upcoming years because technology is developing. On account of this, people in business and industry have to react and change their equipment. The results draft the growth of the importance of qualified employees, technology and know-how. A third of respondents (31.6%) evaluated only the capacity utilisation of the facility. There are many factories in the Czech Republic and the automotive industry still dominates the manufacturing sector. Unfortunately, this sector is sensitive to the changes in the business cycle (Aliu, Pavelkova, & Dehning, 2017). The option the capacity utilisation of the facility and human capital (exceptionally qualified employees) was selected by 40.2% of the respondents while 27.2% agreed with the statement: a complex level of all manufacturing factors (the capacity utilisation of the facility, human capital, materials, sub-orders, financial capital, IT technologies, know-how) and just 1% choose another option. Unfortunately, the European Commission does not have a definition of this term.

Everybody agrees that the answer 'stagnation' is a problem in business and consumer surveys. According to Aysoy and Brand (2017), the dominant category 'unchanged' is a mix of the answer 'do not have an opinion' from other categories. They mention that 'stagnating' can be a signal for economic uncertainty — which is connected with 'don't know' behaviour. According to Ptáčková, Štěpánek and Hanzal (2018), future production and future employment are separated. They find — in comparison with the business and consumer survey with short-term statistical outputs on the microdata level — a significant 60% (70% respectively) change for production and 10% (20% respectively) change for employment. Table 2 shows the answers regarding the significant percentage of the change for selecting a different option than 'no change'. It can be observed that the respondents are more sensitive about employment — 43.5% chose a 5–10% change. For future production, the main category is 10–25% (41.8% of respondents).

Table 2 | Stagnation answers (%)

	Less than 1%	1–5%	5–10%	10–25%	25–50%	More than 50%
Future production	3.4	5.3	33.7	41.8	15.4	0.4
Future employment	7.2	15.5	43.5	27.1	6.7	0.0

Source: Authors' own processing

The respondents are satisfied with the three-option scale (87.1%) for the current and future economic situation evaluation. When asked about the current and future production evaluation, the share of the satisfied respondents was 90%. In the question on the evaluation of the overall economic situation in the company, only 30.3% of respondents distinguished the period of three and six months (when it makes sense for the evaluation) while 35.1% of respondents sometimes differentiate between the three- and six-month period (when it makes sense for the assessment). A figure of 34.6% of the respondents evaluated the mentioned periods as the same.

Are there any sources which influence the respondents' response? Do politicians, analysts and economists change their opinion about the development in the Czech Republic? The respondents have read about the pandemic, Brexit, the coming crisis, the trade war, various political crises and the increasing level of unemployment — all this information can influence their choice when completing the questionnaire.

When asked if they answer the questions only using internal data sources, 66% of the respondents said 'no' while 22.9% of respondents consider economic forecasts. This is beneficial knowledge because the respondents are not manipulated by politicians or other personalities who can change public opinion.

Table 3 | Important data sources (%)

	%
Czech media	9.0
Foreign media	2.9
Economic forecasts	22.9
Geopolitical events	4.3
Branch development abroad	18.6
Outputs of the short-term statistics and BTS	2.9
Statements and political debates	1.9
Statements, debates by economics and professionals	6.2
Other	2.9
No, I only use data from the company information system, or internal data sources	66.2

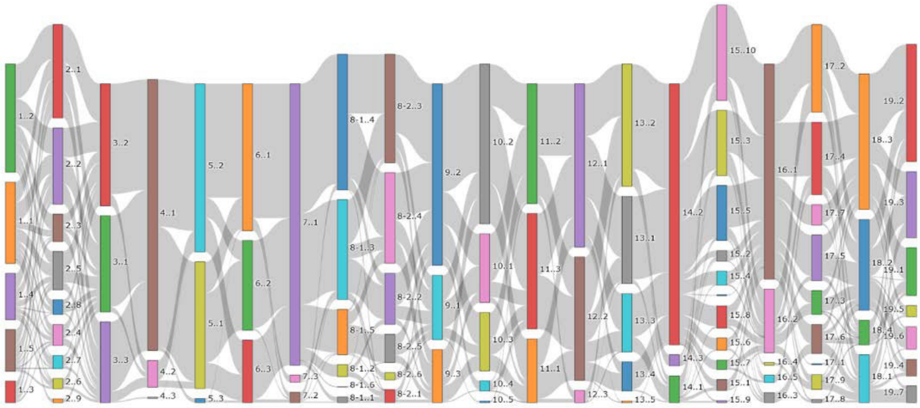
Source: Authors' own processing
Note: Respondents could mark multiple answers, so the sum does not add up to 100%.

Summary: The results are significant to both the users and the analysts as it enables us to know what we can use for our predictions. Business people, managers and politicians make daily decisions about the future development of their companies. Using fast published, qualitative data (on a monthly basis) is beneficial for their conclusions about employees and investments. Business and Consumer Surveys are an important data source about the economy — or their NACE (Nomenclature statistique des activités économiques dans la Communauté européenne) level and sectors.

2.3 Visualisation

In the last part of the paper, we visualised the flow of the answers in the survey on survey questionnaire. Our goal was to understand as much as possible how the respondents answered the questions we asked. To clarify the relationship between the questions, we decided on the following visualisation. We used the Sankey chart, which was created for the whole questionnaire. For this visualization, we used program R and their packages (R Core Team, 2014). Figure 2 describes several columns, each representing one question and the answers it contained. Between the columns are aggregated paths that show the trend in the responses. The aim is for better orientation within the structure of the questionnaire and to observe the flow between the answers. The real power of the visualisation is in the interactivity, so this image was created as an html page, which enables the researcher to focus in more detail on the detail between the questions.

Figure 2 | Answers visualisation



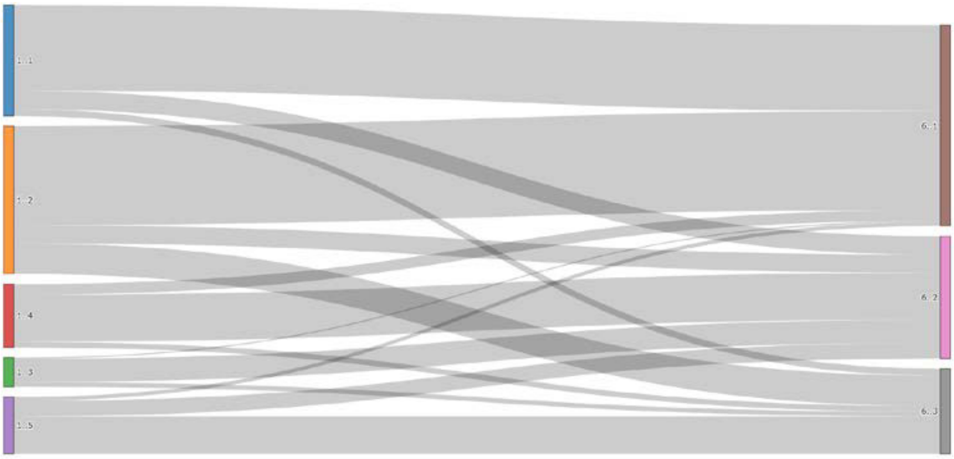
Source: Authors' own processing

However, we are most interested in the relationship between:

- question 1, which asked whether the respondents assess the current level of demand for production using a book of orders. The options were:
    - definitely yes,
    - rather yes,
    - rather no,
    - no,
    - I use another accounting source; I follow my own judgment,

- and question 6, which identified the source they use to estimate future production activity. The options were:
  - o from the order book,
  - o from another accounting source,
  - o I follow my own judgment.

Figure 3 | Visualisation questions 1 and 6



Source: Authors' own processing

In Figure 3, we showed the relationship in the structure between these two questions. From the option: 'I definitely use the order book to estimate the level of demand for production', 77% went to the option that they also use the order book for future activities while 16% of respondents use a different accounting source and the remaining respondents use their own judgement. The important finding from this section is that we know that the results from the respondents are relevant, are based on data and not just the opinion of one employee or a business owner.

We can choose other questions and describe or analyse them. The visualisation means we can understand the respondents — the answers, the relationship between the previous answer and the next response.

Conclusions

The survey on survey opens up a discussion about the meaning of specific terms in the business and consumer survey questionnaire. Through the presented outputs, we can better understand the results from the monthly survey and better describe the near future to the public, journalists and politicians. The visualisation enables us to compile groups of respondents that we can describe and so identify significant information about them. Information from business and consumer surveys is beneficial and is the main reason why we should focus on them — especially in uncertain times. For example, at present, when many companies have stopped production and are worried about the future.

The results of the survey on survey mean we can open up a discussion about creating a methodology on the European/national level for respondents (national handbook), which can assist them in completing the questionnaire. Understanding the responses improves the prediction ability of the survey. Through visualisation, we can define clusters of the respondents and make individual predictions for the sectors or individual terms (as for employment).

In the next research, we will extend this survey on survey to the following sectors — trade, construction and selected services.

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References

Ahmed, M.I., & Cassou, S.P. (2016). Does consumer confidence affect durable goods spending during bad and good economic times equally? *Journal of Macroeconomics*, *50*(Dec.), 86–97. DOI 10.1016/j.jmacro.2016.08.008

Aliu, F., Pavelkova, D., & Dehning, B. (2017). Portfolio risk-return analysis: The case of the automotive industry in the Czech Republic. *The Journal of International Studies*, *10*(4), 72–83. DOI 10.14254/2071-8330.2017/10-4/5

Aysoy, C., & Brand, T. (2017). Investigations on responding behaviour: Case study for the business tendency survey of Turkey. Retrieved from https://www.tcmb.gov.tr/wps/wcm/connect/197f3fbd-81b3-43bb-ab5e-62b9a521c95c/en1705eng.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-197f3fbd-81b3-43bb-ab5e-62b9a521c95c-m3fw5y4

Claveria, O. (2020). Uncertainty indicators based on expectations of business and consumer surveys. *Empirica* (2020), 1–23. DOI 10.1007/s10663-020-09479-1

Claveria, O., Monte, E., & Torra, S. (2019). Economic uncertainty: A geometric indicator of discrepancy among experts' expectations. *Social Indicators Research*, *143*(1), 95–114. DOI 10.1007/s11205-018-1984-2

Claveria O., Monte E., & Torra, S. (2020). Spectral analysis of business and consumer survey data. Retrieved from http://www.ub.edu/irea/working_papers/2020/202006.pdf

CZSO (Czech Statistical Office) (2020). Business cycle surveys — Methodology. Retrieved from https://www.czso.cz/csu/czso/business_cycle_surveys

EC (European Commission) (2020). the joint harmonised EU programme of business and consumer surveys (User guide). Retrieved from https://ec.europa.eu/info/sites/info/files/bcs_user_guide_en_0.pdf

Marek, L., Hronová, S., & Hindls, R. (2019). Possibilities of estimations of short-term macroeconomic aggregates based on business surveys results. *Politická ekonomie*, *67*(4), 347–370. DOI 10.18267/j.polek.1243

Oinonen, S., & Paloviita, M. (2017). How informative are aggregated inflation expectations? Evidence from the ECB Survey of Professional Forecasters. *Journal of Business Cycle Research*, *13*(2), 139–163. DOI 10.1007/s41549-017-0017-6

Ptáčková, V., Štěpánek, L., & Hanzal, V. (2018). Are industrial companies in the Czech Republic able to predict the short-term future of the economy? [Conference proceedings]. Retrieved from http://www.amse-conference.eu/wp-content/uploads/2018/09/AMSE_2018_Ptackova-et-al.pdf

R Core Team (2014). The R project for statistical computing. Retrieved form http://www.R-project.org/

Sorić, P., Lolić, I., & Čižmešija, M. (2016). European economic sentiment indicator: An empirical reappraisal. *Quality & Quantity*, *50*(5), 2025–2054. DOI 10.1007/s11135-015-0249-2

Stefaniak, H. (2016). Survey of Surveys - Business tendency survey carried out by Central Statistical Office of Poland. EU Workshop on Recent Developments in Business and Consumer Surveys, Brussels.

Vázquez, S., García, S., & Rocha, C. (2009). Confianza del Consumidor: ¿Qué Nos Dice sobre la Economía Uruguaya? *Cuaderno de Economía*, 4, 121–47.