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Data Observer

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The High Frequency Firm Survey “Bundesbank Online Panel – Firms”

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Abstract: The Bundesbank Online Panel – Firms (“BOP-F”) is a dataset with responses from a high frequency firm-level survey of the same name. The Bundesbank has conducted the survey since June 2020, and since July 2021 the survey has been carried out at a monthly frequency. Every month, around 3000 firms from all economic sectors, regions and size classes are surveyed. The survey consists of recurring core questions about the economic situation of firms and their expectations and special questions that usually differ from quarter to quarter. The latter often relate to current topics, for instance, climate change, digitalization, Covid-19. The data can be accessed for research and especially the possibility to combine it with other administrative Bundesbank data makes it particularly valuable for research. The objective of this paper is to describe the methodology of the data collection, the content data as well as the data’s research potential.

Keywords: establishment survey, survey methodology, corporate finance, COVID-19 pandemic, labor market, firm decisions

JEL Classification: C81, C83, G30, M21

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1 Introduction

The abrupt and sharp economic collapse caused by the Covid-19 pandemic in spring 2020, triggered a great need for detailed up-to-date information on the economic situation of firms in Germany. The Research Centre and the Research Data and Service Centre of the Deutsche Bundesbank therefore initiated its own online firm survey, the Bundesbank Online Panel – Firms (“BOP-F”), in particular to obtain information on the pandemics effects on the general economy, on the financial situation of firms and on future expectations in the corporate sector.

Since July 2021 until today, the survey is carried out monthly with around 3000 participating firms and has established itself as an important tool providing valuable information for analysts and researchers.¹ The survey data for each month represent a cross-sectional data set. The cross-sectional data from three consecutive months are combined into a quarterly unbalanced panel. Due to the underlying rotating survey procedure with survey of the panel firms every quarter as well as unchanged questionnaires within a quarter, BOP-F contains quarterly survey data with an unbalanced panel structure. Quarterly weights are provided accordingly. Every quarter, around 9000 firms from all economic sectors, regions and size classes are surveyed. The survey consists of recurring core questions about the economic situation of firms and their expectations (e.g. price development or inflation rate expectations) and special questions that usually differ from quarter to quarter. The latter often relate to current topics. While initially Covid-19 was the main focus, meanwhile a large number of topic areas with current relevance were covered. This includes but is not limited to climate change, digitalization, minimum wages, supply chain issues, energy prices etc.

Researchers can access the anonymized data at the RDSC’s guest researcher workstations in a secure environment at one of the RDSC’s locations. One big advantage of BOP-F data is that it can be combined with other administrative Bundesbank data, which makes it particularly valuable for research.

The remainder of this paper is organized as follows. Section 2 introduces the methodology of the data collection, i.e. in particular sampling and weighting, and Section 3 presents the content of the data. Section 4 describes the data access and the opportunities for research, especially through matching with administrative data. Section 5 offers some concluding remarks.

¹ The survey began with a one-year “pilot phase” during which five online surveys were conducted approximately every two months. In addition, before the start of the pilot phase, a pre-test survey with a sample size of 1000 companies was carried out in order to test the questions and the survey design and to obtain initial indications of the response rate and willingness to participate in the panel.

2 Data Methodology

This section contains a description of the methodology including the survey design, the data collection process and the weighting procedure. For further details please check the data report (cf., Boddin et al. 2022). BOP-F is a dataset based on a representative online survey of firms conducted by the Research Centre and the Research Data and Service Centre (RDSC) of the Deutsche Bundesbank in cooperation with an external survey firm, forsa. BOP-F contains quarterly survey data collected monthly over three-month cycles.²

The survey structure is based on a rotating panel principle, as shown in Figure 1. This structure allows us to compile representative data for the population of firms based in Germany on a monthly basis and to reduce survey fatigue for firms. While the BOP-F survey is conducted every month, the questionnaires only change after the end of a quarter. The sample – consisting of both panel and newcomer firms,³ is drawn for an entire quarter and is then divided evenly over the three months. However, once a firm has participated in the survey in the first month of the quarter, it is always invited to participate in the first month of every quarter going forward. In Figure 1, for instance, firms in group 1 will always receive the questionnaire in the first month of every quarter, i.e. January, April, July and October. With this rotating panel design, we keep the burden on firms as low as possible by contacting a given firm only four times a year. However, by conducting the survey monthly, high-frequency monthly data is generated.

Since not all companies are willing to take part in the survey again and the number of participants per wave should be kept comparatively stable over time, the survey sample must be refreshed regularly. The sample for the BOP-F survey is drawn from the universe of firms located in Germany with a taxable turnover of more than €22,000⁴ or at least one employee paying social security contributions.⁵ The sample for every quarter is drawn proportionally to the distribution of the population of firms along three dimensions: (i) a firm size indicator measured in

2 As previously mentioned monthly data is available from July 2021 onwards. Prior to that the survey was conducted at lower frequency.

3 We differentiate between firms that participate in the survey for the first time (“newcomer firms”) and those who have participated before (“panel firms”).

4 In the first waves the boundary for taxable turnover was slightly lower at €17,500.

5 This data base is frequently updated, but the cut-off reporting date on which the data is based on is around two years before the actual survey. Firms which are not classified as natural persons or for which information such as address, sales, or employment is missing are excluded from the sample. Around 12% of the original database could not be used due to missing information. The population contains only enterprises that are registered in Germany. The total available population contains around one million firms.

Rotating Panel Design						
Rotating panel (full questionnaire & 1/3 sample size)						
Only 1/3 of all firms are sent the entire questionnaire in a single month. Firms are split into 3 groups, each of which receives the questionnaire in a different month						
Questionnaire Number	Questionnaire Release	Date	Wave	Firms groups		
				1	2	3
6	A	Jul 21	6	x		
	B	Aug 21	7		x	
	C	Sep 21	8			x
7	A	Okt 21	9	x		
	B	Nov 21	10		x	
	C	Dez 21	11			x

Figure 1: Rotating panel design.

terms of employment and turnover (3 classes), (ii) region (4 classes), and (iii) economic sector (6 classes). Thus, the sample is drawn from 72 strata ($3 \times 4 \times 6$). Afterwards, the quarterly sample is distributed equally over three months.⁶

Due to the disproportional sampling design of the BOP-F survey, if unweighted, data analysis would lead to non-representative results. In order to make the results representative of the universe of German firms weights are created along the three dimensions mentioned above.⁷

The field work of each wave usually starts on the first business day of a month and ends around 22 days later.⁸ After about half the time of the field phase, firms are reminded to participate in the survey. Only firms that have not responded by then receive reminders. One day before the field phase ends firms receive a final

6 The sectoral classification corresponds to the IAB's Establishment Panel classification and is similar to NACE Rev. 2.

7 In the first step, design weights were created by using the inverse of the inclusion probabilities. Then, sampling weights for each stratum are iteratively adjusted by using an iterative proportional fitting procedure. The aim of this procedure is to adjust the sum of weights for each marginal dimension of the target variables to the distribution of the population until a predefined convergence criterion is achieved. The target structure is based on three dimensions: region economic sector and firm size class.

8 The first five rounds of online pilot surveys were conducted approximately two to three months apart and a field phase lasted for about 20–40 days.

reminder. This second reminder is sent via email only and thus only to panel firms who provided their e-mail-address.

To ensure that highly ranked executives fill out the questionnaire, the phrase “for the attention of the management” (in German: “zu Händen der Geschäftsführung”) is printed on every envelope with survey invitations. Before each survey, respondents are informed that the survey would take around 15–20 min to complete. The actual median interview duration for uninterrupted interviews lies within this time interval. Around 60% of the newcomer firms state that they are willing to take part in the future surveys. The actual future participation rate, however, is lower.

Table 1 summarizes the key figures discussed in this section for each wave. The first column states the wave and the second column the duration of the field phase. Column three contains the number of firms that have been contacted to participate in the survey, whereas column four contains the number of successful interviews that corresponds to the number of observations in our data. As mentioned previously, the monthly design with a smaller number of observations was introduced in July 2021. Column five contains the response rate in percent, which is the share of participated over contacted firms. Column six contains the share of panel firms, i.e. firms that already had participated in the survey prior to that wave. The remaining firms are newcomer firms. Column seven states the median duration that firms required to finish the survey.

As already mentioned, during the pilot phase lasting until wave five, the sample size was significantly larger and the field phase longer. Since the introduction of the monthly frequency in wave 6, both the gross and the net sample size have been stable. Currently, (as of December 2022) 43,189 different firms participated in the survey which lead to 104,270 finished interviews and thus observations in the data. Also the response rate is rather stable at around 15% to 20%. Not surprisingly, the share of panel firms has steadily increased over time. Currently, more than 80% of firms that take part in the survey have done so before.

3 Content of the Data

The questionnaires in the BOP-F study comprise a set of core and special questions. Core questions are included in every survey wave, change little from one quarter to another and ask about the economic situation of firms and their expectations. In general, the core questions cover the three main areas (I) macroeconomic questions, (II) microeconomic questions related to real decisions, and (III) microeconomic questions related to financial decisions. Some of the core questions are probabilistic and allow measuring firms’ uncertainty regarding their external environment (e.g. the key interest rate) and their own future key figures and outcomes (e.g. sales).

Table 1: Key figures by wave.

Wave	Field phase duration	Gross sample	Net sample	Response rate (in %)	Panel share (in %)	Duration in minutes
1	June 18–July 27 2020	80,169	10,711	13.36	–	10.87
2	August 26–September 30 2020	66,210	9150	13.82	43.90	9.44
3	October 9–November 13 2020	131,151	12,462	9.50	38.38	18.02
4	January 29–March 2 2021	101,360	16,241	16.0	51.64	15.90
5	May 6–May 26 2021	35,820	2771	7.74	39.91	17.53
6	July 5–July 27 2021	16,590	2684	16.17	80.77	16.23
7	August 2–August 24 2021	16,603	3042	18.32	82.28	16.27
8	September 1–September 22 2021	16,590	2853	17.20	81.98	16.85
9	Ocotber 1–October 22 2021	16,617	2944	17.72	83.19	11.95
10	November 1–November 22 2021	16,631	2971	17.86	84.92	12.07
11	November 26–December 17 2021	16,132	2825	17.51	81.84	12.38
12	January 7–January 28 2022	17,316	3336	19.20	79.87	16.67
13	February 3–February 24 2022	17,316	3189	18.41	78.36	16.40
14	March 1–March 22 2022	16,888	2702	16.00	78.61	17.23
15	March 31–April 25 2022	16,837	2829	16.80	84.31	17.07
16	May 2–May 23 2022	16,857	2912	17.27	83.21	16.98
17	June 1–June 22 2022	16,784	2973	17.71	81.80	17.27
18	July 1–July 25 2022	17,282	3177	18.38	79.04	16.48
19	July 29–August 23 2022	17,314	3092	17.86	81.69	16.45
20	August 31–September 23 2022	17,201	2996	17.42	79.57	17.53
21	October 1–October 26 2022	17,316	3040	17.56	80.56	12.02
22	October 28–November 24 2022	17,325	2849	16.44	83.61	12.90
23	November 30–December 22 2022	17,244	2521	14.62	85.80	12.86

The core questions are supplemented by special modules that differ from quarter to quarter. They are designed for more in-depth investigation of certain topics and are often about important current issues. The main focus of the special questions prior to July 2021 (i.e., during the first five survey waves) was the measurement of the impact of the Covid-19 pandemic on firms. These include, for

example, the impact of the temporary VAT reduction, the analysis of potential liquidity bottlenecks, and the pandemic-induced digitalization. Recently, the focus of the special questions has broadened and covered a greater variety of topics. This includes but is not limited to climate change, digitalization, minimum wages, supply chain issues, energy prices etc. The survey design makes it possible to quickly react to unforeseen and sudden events. Table 2 contains a detailed overview of special questions covered in each wave. The questionnaires for the individual waves contain more detailed information and are available for download from the project website: <https://www.bundesbank.de/en/bundesbank/research/survey-on-firms>.

Additionally, the questionnaires contain questions on the firm characteristics as well as firm feedback. The data contains information on the firm’s self-reported employment and turnover as well as region and economic sector. Respondents also categorize their position within the firm and the firm type in general. Eventually they evaluate the perceived difficulty and length of the questionnaire. Finally, the BOP-F dataset also includes paradata, for instance, whether the interview was interrupted and the length of the interview.

Table 2: Overview of topics in the special modules of BOP-F.

Wave	Questionnaire	Topic(s)
1	1	Covid-19 production and employment reactions, KfW credits, liquidity
2	2	Short time work, VAT reduction, fintech, deferrals
3	3	Climate change, inflation expectation, unemployment rate
4	4	Liquidity sources, price changes, VAT effect
5	5	Digitalization, quantitative changes
6	6	Payment instruments, production costs, inflation expectations, negative interest rate, RD investments
7		
8		
9	7	Second order inflation expectations, financing during financial crisis, Covid-19 & homeoffice, Blockchain
10		
11		
12	8	State aid, investments, energy costs
13		
14		
15	9	Russia–Ukraine war, price changes, corporate ratings, investment expenditure on software and hardware, energy prices/consumption, production costs and prices
16		
17		
18	10	Russia–Ukraine war, safeguard clauses, minimum wage, climate policy measures
19		
20		
21	11	Russia–Ukraine war, hiring plans, remaining debt and funding costs
22		
23		

4 Data Access and Use for Research

Access to BOP-F microdata is provided at the RDSC's guest researcher workstations in a secure environment at one of the RDSC's locations. This form of access is necessary in order to meet the statutory provisions concerned with safeguarding the confidentiality of statistical reports and, at the same time, to enable access to individual data for independent academic research purposes. To get access to the data, researchers are asked to submit a research data request including a research proposal. A research proposal is checked for feasibility of the research project given the research data, i.e. the suitability of the data to answer the research questions raised by the proposal. The research project must be of public interest. Commercial projects will not be accepted.

One of the major advantages of BOP-F data is that it can be combined with other administrative Bundesbank data, which makes it particularly valuable for research. This includes but is not limited to other firm-level data such as balance sheet information (e.g. Janis) or information on foreign direct investments (e.g. MiDi). The data completes a series of Bundesbank survey datasets, including household surveys such as Bundesbank Online Panel – Households (“BOP-HH”)⁹ or the Panel on Household Finances (“PHF”).¹⁰ BOP-HH is also a high-frequency monthly survey. The structure and partly also the content of the questions are similar (e.g. with regard to inflation expectations), which allows a certain comparability between the company and household surveys.

Although the data has not been available for long, there are already first papers that use the data. For instance, combining the survey data with administrative data, Boddin et al. (2020) investigate whether government-subsidized loans are an important policy measure to sustain the real economy during non-financially-driven crises like the Covid-19 crisis or whether they might in fact hurt long-run economic growth by keeping unprofitable firms alive.¹¹ Gärtner and

⁹ For further information see <https://www.bundesbank.de/en/bundesbank/research/rdsc/research-data/bop-hh-757542>.

¹⁰ For further information see <https://www.bundesbank.de/en/bundesbank/research/rdsc/research-data/phf-755932>.

¹¹ They find that firms identify pessimistic and uncertain beliefs about future demand, rather than current or future credit constraints, as the main impediment for their business. Demand-driven uncertainty is also what limits firms's demand for credit. Firms predominantly rely on retained earnings to finance their operations. Those who access external financing do so largely through regular commercial loans rather than loans guaranteed by government programs. Firms that apply for government-guaranteed loans are more likely to display zombie features. The survival of these firms could hamper structural changes in the economy, which would worsen rather than improve the economic outlook in the medium to long term.

Marek (2022) investigate the effect of German emergency aid transfers during Covid-19 on firms.¹²

Furthermore, the availability of paradata combined with self-reported survey information as well as official administrative data makes BOP-F a valuable source for questions about survey methodology. For instance, Boddin et al. (2023) investigate the effect of last-minute reminders on survey participation rates.¹³

5 Concluding Remarks

This paper introduced the BOP-F data, a high frequency firm-level survey that was introduced under the impression from the Covid-19 crisis. Today, the survey is carried out monthly with around 3000 participating firms and has established itself as an important tool providing valuable information for analysts and researchers. Especially in combination with administrative data, it can be expected that the survey will open up possibilities for future research.

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¹² Thy find that firms substantially benefitted from aid transfers, for instance in terms of liquidity.

¹³ They find that sending reminders to prospective respondents two days before the survey was closed increased their participation likelihood by 8.9 percentage points compared to firms that were not reminded.