The German Business Panel:
Firm-Level Data for Accounting and Taxation Research [*]

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Abstract

The German Business Panel (GBP) periodically surveys key decision-makers via a large sample of companies in Germany. The survey questions investigate managers' accounting and taxation choices as well as the expected and perceived outcomes of those decisions. To obtain causal evidence, the survey supports the use of randomized survey experiments. The evidence from the GBP can meaningfully advance our understanding of issues that require data on internal processes as well as expectations, perceptions, and objectives behind ex-post reported accounting figures. The target population comprises the universe of legal entities included in the official German Statistical Business Register. We show that the dominance of small and medium-sized entities is a feature that Germany shares with many European countries, implying that GBP findings will be reasonably generalizable to European settings. We illustrate the usefulness of GBP data by presenting evidence from the initial waves of the GBP during the COVID-19 pandemic. The findings show how government aid programs contributed unevenly to the solvency of the most negatively affected companies, and how companies, rather than consumers, benefited from a temporary reduction of VAT rates. The paper also demonstrates how the scientific community can use the GBP data.

JEL classification: C81, D22, D25, D80, D84, H00, H12, H32, H20, H24, H25, M40, R38

Key Words: *Covid-19, Firm survey data, German Business Panel, Survey design, Tax Expectations, VAT*

1.   Introduction

While prior research in accounting and taxation has addressed a wide variety of different questions relating to both the determinants and consequences of managers' reporting choices, much of the empirical literature is still uniform in its choice of data sources. Most of the evidence comes from archival data provided by public databases that compile company filings such as regulated financial or non-financial reports. These common repositories of archival data offer relevant information on ex-post realizations of accounting and taxation choices. However, they do not offer information on the design of internal processes and organizational structures of companies. They also cannot capture expectations, perceptions, and objectives that enter into the decision-making of managers and eventually shape the published accounting figures and taxation outcomes (Bloomfield et al., 2016; Graham et al., 2005; van der Stede et al., 2005). The German Business Panel (GBP) collects such data through an ongoing survey of executives and key decision-makers in a representative sample of companies from Germany. The purpose of this paper is twofold: we introduce the characteristics and the structure of the GBP data into the accounting and taxation literature, and we illustrate how its use can contribute to an advancement of this literature.[1]

We can classify the data provided by the GBP into two categories. The first set of variables describes inputs into managers' decision-making and, thus, helps explain the determinants of companies' accounting and taxation choices. These variables include information on the organization of a company's finance function as well as the design of internal controls in managerial decision-making. The variables also capture expectations (e.g., the future

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[1]   Recent papers that have already used GBP data include Gassen and Muhn (2024), Ho et al. (2023).

tax burden), perceptions (e.g., the flexibility of the cost structure), and objectives (e.g., the intended direction of accruals choices) that plausibly affect these decisions. The second set of variables is intended to allow researchers to assess the consequences of accounting and taxation choices, including the impact of external factors (especially regulation). While these variables offer information on common outcomes of corporate accounting and taxation (e.g., investments, pricing, employment, or costs), they are also supposed to record more qualitative constructs (e.g., the level of transparency in an industry). The GBP is able to implement experimental manipulation for both sets of survey variables and, thus, provide more than descriptive evidence of important economic phenomena in the area of accounting and taxation.

Against this background, the GBP has the potential to advance research in accounting and taxation in two different ways. First, although many data sources are publicly available and widely used in research,[2] common commercial databases and government-provided datasets are limited in terms of coverage and scope (e.g., Becker et al., 2021; Garcia Lara et al., 2006). For the most part, they contain only quantitative data from publicly disclosed financial statements or information provided in tax filings, whereas they do not cover managers' rationales and attitudes behind these numbers. Commercially available datasets also focus on publicly listed firms. As a result, we know little about the economic behavior of private firms, which are often small in size but represent the largest share of companies in most economies around the world (Angelini & Generale 2008; Poschke 2018). Hence, as a complement to existing archival data, the GBP offers

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[2]   The Accounting Review used to publish submission statistics by research method and subject area. In total, 74.7% of all submitted manuscripts have used empirical analyses based on archival data (DeFond, 2015).

unique data for researchers aiming to explore managerial decision-making in companies with different legal forms and sizes.

Second, stand-alone or combined with other variables from public repositories of company data, the use of GBP variables can help triangulate evidence from archival data on questions in accounting and taxation that are particularly affected by data concerns. This includes accrual choices in financial reporting (e.g., Ball, 2013), the design of a company's costing system in management accounting (e.g., Labro, 2019), or the effects of tax uncertainty (e.g., Jacob et al., 2022). We exemplify how using GBP data can advance the empirical literature on these questions in Section 2.

Sections 3 and 4 provide details on the survey administration, the target population, and the sampling procedure. We also benchmark the sample and selected survey variables against official statistics and other data sources. These sections explain the recurring nature of the GBP which offers the opportunity to study managerial decision-making and its consequences over time and to identify trends while controlling for unobserved firm-specific effects. The panel design is a particularly distinguishing feature compared to previous one-shot survey studies in accounting and taxation such as Graham et al. 2011; 2014; 2017), or Robinson et al. (2010). Another distinctive methodological feature is the implementation of the GBP as a rolling panel, which combines the benefits of a rolling cross-section design and a panel data framework.

To further illustrate the potential use of the GBP data, Section 5 of the paper presents evidence from the initial survey waves of the GBP during the COVID-19 pandemic. Drawing from a base sample of firms available in the Orbis database, the GBP obtained more than 10,000 completed survey responses from companies across many industries during its first wave. These analyses offer examples of how evidence from GBP data can inform a policy assessment. First,

the results suggest that a state-aid program, like the one in Germany, which is based on revenue subsidies rather than a cost refund fails to target most affected groups of companies. Second, the results imply that a reduction of VAT rates helps companies alleviate cost pressure, but is not, or to a much lesser extent, associated with a decrease in consumer prices.

While this evidence illustrates how the GBP data can benefit research on questions that require timely data on internal processes and structures of companies as well as the expectations, perceptions, and objectives of their key decision-makers, it also points to some critical limitations of survey data. While the general limitations of any survey data (especially selection bias and measurement error; e.g., Snijkers et al., 20213) also apply to the GBP, additional challenges arise because the GBP is supposed to provide company data (on the organizational level). First, many research questions will require GBP data to be combined with fundamental firm characteristics (especially reported accounting and taxation figures). The potential of GBP data for this purpose hinges on a sufficiently comprehensive match with firm-level identifiers in other databases which is further impeded by data protection requirements. Second, the motivation and willingness of participants (i.e., managers with limited time) are constraining factors that are negatively affected by complex and lengthy questions even if those are warranted by the underlying research question. Under time constraints, it is then especially uncertain whether the responses of individual managers express more than an instantaneous personal view and fully represent the collective view of their organization. As with all surveys, the scope and depth of the GBP questions are thus naturally limited.

As the availability of GBP data to the research community is a key objective, the last section of the paper (Section 6) provides information for researchers on how to access the

existing GBP data, how to contribute to the GBP with their own research questions, and how to work with the data in compliance with the data protection regulations.

2.   Opportunities for Survey Data in Accounting and Taxation Research

This section presents three examples from different fields where evidence from company surveys can meaningfully contribute to filling relevant gaps in the current literature.

2.1.   *Financial Accounting: Managers' Use of Reporting Discretion*

There is robust evidence that managers have reporting incentives when making accounting choices and thus use their reporting discretion opportunistically to reap private benefits (e.g., Burgstahler et al., 2006; Dechow et al., 2010). While illegal activities (i.e., fraud) are plausibly rare, it is notoriously difficult to detect reporting bias that remains within the boundaries of GAAP. Therefore, there is no consensus about the prevalence and magnitude of reporting discretion or, more specifically, earnings management (e.g., Ball, 2013; Gerakos & Kovrijnikh, 2013). One important reason for this disagreement is the opacity of the process by which managers apply accounting rules and make their accounting choices.

Prior research has developed a very rich set of proxies that are intended to overcome the unobservable accounting choices. Many proxies divide earnings into a non-discretionary part that reflects the economic fundamentals and a discretionary part that represents the managerial bias (see Dechow et al., 2010, for a comprehensive overview). Other proxies aim to capture the intended properties of reported earnings (e.g., timeliness or persistence; Ewert & Wagenhofer, 2011). For listed firms, earnings announcements offer an additional proxy for the informational usefulness of the reported accounting numbers. All of these proxies are observable outcomes of

the accruals process. However, they remain controversial because they fail to disentangle (1) the economic fundamentals, (2) the impact of the accounting rule, and (3) the role of managerial incentives in the discretionary application of the rule (e.g., Gerakos, 2012; Ball, 2013; Leuz & Wysocki, 2016; Becker et al., 2021; Bischof et al., 2021). This failure is mainly attributable to the unobservability of the input into the accruals process, such as managerial motives and intentions, dealing with uncertainties, and managers' learning over time.

Prior survey studies have addressed this exact gap. Evidence of Dichev et al. (2013) suggests that approximately 25% of companies use accounting discretion opportunistically, which accounts for 10% of their earnings on average. These managers confirm the existence of common reporting incentives (similar to Graham et al., 2005), but they also agree with the view that reporting discretion is hardly identifiable from the outside. Cross-sectional survey data is useful to triangulate the evidence from archival proxies for earnings management and earnings properties. However, it is also subject to different biases, and it is especially plausible that the same incentives that drive a CFO (Chief Financial Officer)'s reporting choices also influence their survey responses (Nelson & Skinner, 2013).

A panel survey offers at least two advantages that potentially help reducing the limitations of cross-sectional surveys. First and most obviously, the panel tracks answers over time and, even if the responses about the magnitude and the direction of a sensitive management decision like the opportunistic use of reporting discretion (e.g., in the form of earnings management) are biased in their levels, changes in the time-series can help reveal the underlying determinants, i.e., open the black box of the accruals process, especially when amended by panel data on other, simultaneous changes in the company's internal organization, processes, and information environment. The GBP collects those exact variables on an ongoing basis and could

thus serve as a starting point to provide this evidence. Second, the design of the panel also integrates experimental treatments (such as information experiments or list experiments) that aim to directly reduce the bias in managers' responses.

2.2. *Managerial Accounting: Cost Structure and Operating Planning*

A second example is the design of a company's costing system (Labro, 2019). As the cost structure, i.e., operating leverage, is a key determinant of financial flexibility and a company's ability to cope with unanticipated shocks (e.g., Fahlenbrach et al., 2021; Barry et al., 2022), evidence on the setup of the internal reporting of these costs can help understand its intersection with other decisions about risk-taking and organizational design. However, managers tend to view this information as proprietary and are, therefore, hesitant to provide disclosures. Empirical research in management accounting has developed proxies that capture cost elasticities (with regard to changes in sales volume; Bhojraj et al., 2021) and cost stickiness (Banker & Byzalov, 2014). However, as the cost structure is also a function of a company's fundamental business model, it remains unobservable to what extent the estimated cost structures are intentionally set by management and how managers factor the cost structure into other decisions.

There are several prominent settings where fixed costs play a potentially crucial role for managerial decision-making. An important one relates to short-term planning, when managers make decisions by means of a cost-volume profit analysis (CVP). At first glance, when introducing uncertainty to CVP analyses, decision makers' individual characteristics do not enter the equation (e.g., Jaedicke & Robichek, 1964). However, fixed costs can be decision-relevant under uncertainty if utility functions become non-exponential (e.g., Dillon & Nash, 1978). In case of delegation, i.e., in a principal-agent setting, the agent's risk-aversion also becomes a

critical factor. Thus, the problem has become both stochastic and individual, implying that the magnitude and the impact of fixed costs can only be determined empirically.

While survey responses to sensitive questions like those about cost structure and operating leverage, are subject to plausible response bias, the time-series feature of GBP data can help quantify the magnitude of fixed costs and the impact of cost structure and operating leverage on decision making (Bischof et al., 2022). In addition, the GBP provides revenue and cash flow data over time, even for privately held companies. Exploiting adjustments of cash outflows and planning decisions during a crisis such as the Covid-19 pandemic offers opportunities for the estimation of other cost elasticities, even without a direct question about such a sensitive issue. When amending the cost data with proxies for the risk attitude of the decision makers, all components are available to test models such as Dillon & Nash (1978), with changes in the variables even being observable over time.

2.3.   Taxation: Tax Uncertainty

A third example is the effect of tax uncertainty (e.g., Jacob et al., 2022). Publicly available data that exploit real-world events as a source of uncertainty make it difficult to disentangle uncertainty effects from average expectation effects (e.g., Rehse et al., 2019; Brogaard et al., 2020). While uncertainty is generally recognized as an important factor for firm decisions, the specific empirical literature on tax uncertainty is small. This is despite the fact that an improved understanding of the effect of tax uncertainty on firm decisions is critical for the general understanding of the role that taxes play for firms. For example, a firm's investment decision (maybe using an NPV approach) naturally depends on tax rates and regulation in the future. An improved understanding of how tax uncertainty affects investments therefore is a critical component for understanding how taxes affect investments. A notable exception in the tax

literature is Jacob et al. (2022) who use the implementation of a policy (schedule UTP) that requires firms to privately disclose additional details about uncertain tax positions to the IRS to study the effects of tax uncertainty on investments.

A key challenge in all uncertainty studies (tax and non-tax related) using archival data is that the leveraged uncertainty-generating events and policies do not only shift uncertainty (the second moment). They will usually also shift the average expectations of firms (the first moment). It is then difficult to disentangle whether the observed effects are caused by the change in uncertainty or by the shift in average expectations. To overcome this significant challenge, some recent papers have used surveys to exogenously shift uncertainty, without shifting the first moment. For example, Coibion et al. (2021), using household surveys, implement such a design to study the effect of macroeconomic uncertainty on household spending. To manipulate tax uncertainty exogenously in the GBP (without shifting the first moment), we intend to build on Coibion et al. (2021) and apply their design to the tax context in a firm survey.

3.   Survey Design, Sampling, and Administration

This section provides background information about the set-up and implementation of the GBP. We first outline the sampling approach and define the target population (3.1) before discussing measures to ensure data quality (3.2). The statistics and numbers provided in this section and Section 4 mainly come from the first wave of the survey (which was in the field between July and October 2020). At several points, we include statistics and results from the second survey wave (this second wave was in the field between November 2020 and July 2021). Text and notes always clarify which survey waves we include. In total, we obtained 10,174 complete survey

responses in the first wave and 8,570 complete responses in the second wave.[3]

3.1.   *Sampling Frame and Benchmark Population*

The target population of the German Business Panel consists of all legal entities active in Germany as defined by the Federal Statistical Office in the statistical business register. In practice, this refers to all businesses that have their own legal form (Deutsche Bundesbank, 2021).[4] The Federal Statistical Office reports a total of 3,559,197 companies that were active in Germany in financial year 2019. 99% of these companies are small and medium sized entities as well as sole proprietors. These entities represent an important subset because they generate 56% of employment and 43 % of gross value added in Germany according to the Federal Statistical

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[3]   The original questionnaires, as well as further information, for the two waves are available online on the website of the German Business Panel: https://gbpanel.org. The GBP codebooks of the first two waves (including the original and translated survey questions) are available at https://gbpanel.org/page/data.

[4]   In German official statistics, a legal entity, "rechtliche Einheit" (until 2017 called enterprise, "Unternehmen") is defined as the smallest legally independent unit that keeps accounts for commercial or tax law purposes. Such a legal entity must assess the stock of its assets and the performance of its economic activity on an annual basis. An establishment "Niederlassung" (until 2017 referred to as a business, "Betrieb") is a local unit assigned to a legal entity and does not have such an obligation. Our definition abstracts from private agreements (e.g., a profit transfer or control agreement), as there is no register in which such agreements are publicly reported. It also abstracts from consolidated tax filing status (steuerliche Organschaft). These latter constructs are not useful as a sampling unit or to calibrate marginal distributions, because they are not reported in any official statistics and could thus, for example, not be used for the construction of weights to achieve representativeness.

Office.[5] Moreover, as many of them are not required to publicly disclose information, they offer a particularly useful sample to study reporting incentives for voluntary disclosure (Gassen & Muhn, 2024; Minnis & Shroff, 2017). As contact addresses from administrative registers such as the statistical business register are not available, the sampling frame of the GBP is based on a contact database compiled from commercial providers of company addresses. We derive the core sample of the GBP from Bureau van Dijk's coverage of German firms – both private and public ones – in their Orbis and Amadeus databases (the flat files). The Orbis and Amadeus files thus serve as a substitute for the administrative data on legal entities.

Because the GBP is set up as an online survey, we use the 949,463 companies (i.e., about one third of the target population) with available information about their email contact in the 2019 files from Orbis and Amadeus as the starting point for our sample construction. To increase the sample size, especially for those types of companies that are of particular interest for accounting and taxation research (e.g., specific legal forms), future survey waves will combine the core sample from Orbis with convenience samples recruited from existing networks (e.g., the German Schmalenbach Society or corporate partners of the universities involved in the "Accounting for Transparency" research center). In its first wave, the GBP invited all 949,463 companies by email to participate in the survey. About two-thirds of the emails could not be delivered and were bounced back to us, e.g., because the email address was not valid or due to sender side mailing issues. 331,300 firms received our email invitation. These email recipients represent about 12% of all 2.8 million German active firms contained in the Orbis flat files in

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December 2019 (see Appendix A for more details on the sample construction). The invitation emails include a personalized link to a survey created using the Qualtrics software. 15,414 firms started the survey by responding to the question on their revenues category, and we collected 10,174 complete responses in the first survey wave, corresponding to a response rate of 3.1% (10,174 out of 331,300 firms). We use a rolling cross-section design in which we send out survey invitations on a rolling basis. This procedure, described in more detail in Appendix A, allows for high-frequency tracking of variables over time.

3.2.   Data Quality

The GBP ensures high data quality by carefully developing and testing questionnaires. First, we conduct cognitive pretests with respondents in different positions (especially CFOs, chief accountants and tax officers, other managers, owners) from various industries, regions, and firm sizes. These pretests take place in the several months prior to the fielding of the survey questionnaire. The contacts come from the network of managers who indicate their willingness to support academic research when answering regular GBP surveys. The main purpose of these pretests lies in the generation of feedback on the understandability, unambiguousness, and appropriateness of the survey questions for different types of respondents. Second, all questionnaires are required to be developed from publicly pre-registered research proposals that include power calculations and an analysis plan. We publish these documents on the GBP submission module website (https://gbpanel.org/page/gbp-submission-module). The pre-registration supports the rigorous link between the initial research hypotheses and the question design. Third, the GBP runs all questionnaires as pilots with a small number of participants prior to their eventual fielding. These pilot runs mainly serve to detect any remaining implementation problems.

4.   Sample Demographics, Biases, and Representatives

In this section, we provide evidence on respondent characteristics (section 4.1), discuss

measurement error biases (4.2) and non-response biases (4.3). We then evaluate the

representativeness of our survey for the target population (4.4) and the generalizability of GBP

data to broader international settings (4.5), especially in Europe.

4.1.   *Descriptive Statistics on Respondent Characteristics and Response Quality*

The GBP includes questions on characteristics of the survey respondents. The questions in our

survey are eventually answered by individuals and because there is no "acting company", only

acting individuals, the survey answers may depend on the individual that is asked within the

company. To assess which individuals within the company reply and whether they can provide a

view that is representative for the company, survey questions on respondent characteristics shed

light on the respondents' status and function in the company as well as their familiarity with the

decision-making process in their companies. The responses show that the majority of

respondents are owner-managers and CEOs (94.15%), who are likely to have a good overview of

most operations within a company (especially in small firms) and whose attitudes and

expectations are relevant for business decisions. A smaller share works in the finance,

accounting, tax, or marketing department. Another small group indicates other departments,

often also in a leading position. The high number of respondents who do not wish to specify their

position (33.4%) might reflect the importance of data protection (the share has decreased in more

recent GBP waves).

A similar picture emerges when asking for their function in the firm. Most respondents

indicate that they are owners and top-level executives, with a few being department heads, or

having other functions like board membership. Again, many respondents refuse to specify their function (26.17%). The distribution of the respondents' highest qualification shows that a master's degree is most common, followed by having served an apprenticeship and holding a master of craft's degree. Further, respondents' distribution reflects almost exactly the gender share in the German Commercial Register.

Table 1 reports how respondent characteristics vary with firm size. The share of female respondents is around 20% for all size classes. The share of owner-managers and CEOs decreases with firm size. In larger firms, more respondents are heads of departments. This is not surprising, because firms are more often organized into departments if they are larger. Although across all size groups, most respondents have university degrees, this share is even higher in large firms and less prevalent among small crafts businesses (Rostam-Afschar, 2020). Overall, the survey respondents thus appear well equipped to be the target persons in a firm who are able to answer the type of questions that we have, whose expectations matter for firm strategies and decisions, and who have the authority to make decisions.

To validate how our survey performs in terms of response reliability, we consider some variables that are not included in register or administrative data and compare how these variables compare to corresponding variables in other surveys. Table 2 shows respondents' perception of the Covid-19 pandemic as a source of uncertainty. We benchmark these answers to an equivalent question from the survey by Bloom et al. (2021). Taking into account the differing samples, we can conclude that the GBP result that 89.5% of businesses face substantial uncertainty from the pandemic is in line with the finding of Bloom et al. (2021) who report that 94.6% of their respondents face substantial uncertainty.

We further benchmark the findings of the GBP on the prevalence of earnings management against the results of the U.S.-based CFO survey by Dichev et al. (2013) in Table 3. The GBP asks its participants about the systematic effects of accounting options and accounting discretion on the current period's earnings (variable *em1*). 19.15% of respondents answered that their reporting decisions systematically affected the current period's earnings in any one direction. Among this group, the majority (66.44%) report that they managed earnings downwards (rather than upwards). These rates differ from Dichev et al.'s (2013) results. The prevalence of earnings management is somewhat smaller in the GBP sample (19.15% vs. 24.92%), and the fraction of companies managing earnings upwards is considerably lower (33.56% vs. 57.40%). Both shares are statistically different according to a test of proportions (p-values <0.0001). Alternative explanations are possible for these differences, e.g., the sample composition (with a much larger fraction of smaller, privately held companies in the GBP sample), the legislative framework (with tax incentives playing a potentially greater role for the GAAP reporting of German firms), and the time period (with incentives for income-decreasing reporting opportunism potentially special during the economic crisis). The comparison thus illustrates unique opportunities to address open questions about the role of earnings management in companies' reporting strategies.

We present a complementary analysis on the risk aversion of GBP respondents and participants in the SOEP survey in Appendix B.3.

4.2. Measurement Error Bias

A strength of survey data is that perceptions, expectations, and opinions may be elicited. However, this comes at the cost of potential biases. Two types of biases are particularly important for survey data: measurement error bias and non-response bias. The former dilutes

effects biasing correlations under specific preconditions toward zero and may be reduced by higher quality questions and responses. Non-response bias may distort correlations in any direction but since it can be shown to be a form of omitted variable bias, this bias may in principle be handled by including additional variables. We discuss both biases in this and the following section (a more formal conceptualization can be found in Appendix B.2).

Measurement error may result from using imperfect proxy variables (e.g., accruals as a proxy for financial accounting discretion), from a vague formulation of questions, or from cognitive biases like recall bias. To assess how important measurement error in the GBP data is, we compare the properties of GBP variables with archival data (under the strong assumption that archival data are measured without error). We asked all survey participants for their consent to merge their data with external data sources. Overall, 55% of all participants in the first survey wave allowed this match. As the firm's contact information is drawn from Orbis, we can match responses from all consenting firms to other information available from Orbis. As reported in Appendix B, for 15.9% of those firms that we match to Orbis, we obtain data on operating revenues. Similarly, the fraction is 14.3% for data on total assets. These fractions are higher than for the full Orbis population of firms in Germany where data on operating revenues and total assets is only available for 10.7% and 12.8% of the observations.

To examine whether survey respondents give accurate responses about their firms, we select two variables that are included both in the survey and Orbis. Table 4 presents this comparison for revenues (upper part) and the number of employees (lower part) in 2019 each. The degree of consistency can be inferred from the shares reported on the diagonals of the tables. Reassuringly, the revenues of almost 90% of all Orbis firms fall into the same category according to their survey response and the Orbis data (the 90% is calculated by summing up the

values on the diagonal: 73.7 + 11.6 + 3.1 + 1.3). The high degree of consistency between the two

sources is quantified by Cohen's κ, which takes the value of 71.49% (rejecting the null that there

is no agreement between the two data sources with a p-value < 0.001). With respect to the

number of employees, Cohen's κ takes the value of 56.30% (p-value < 0.001), which again

reflects a high degree of consistency in this size measure. Note in the context of this analysis that

differences between survey responses and Orbis information may also occur for reasons other

than false reporting. Most differences between the GBP data and the Orbis data occur for firms

with few employees. Here, differences in the counting procedures (e.g., headcount vs. FTEs)

easily lead to changes in categories (e.g., when apprenticeships, part-time work, or parental

leaves occur). In general, the comparison of archival data and our survey responses underscores

that the GPB can also gather numbers and facts. This is particularly valuable in situations where

other sources of information (e.g., balance sheets, government statistics) either do not include the

number of interest, or when decision makers (e.g., in firms and politics) need information on a

timely basis and the "objective" statistics are not readily available (yet).

4.3. Sampling Bias and Nonresponse Bias

The literature on the design of surveys distinguishes between bias in the estimates due to unequal

probabilities of selection from the target population (sampling bias) and due to non-response

(e.g., Snijkers et al., 2013). The first type of bias can result from differences between the target

population (official business registry in our case) and the sampling frame (Orbis data base).

Depending on the direction of differences, this is known as overcoverage or undercoverage. An

example of overcoverage in our context is the inclusion of contact addresses of firms that are no

longer active on the market, e.g., due to bankruptcy. Undercoverage occurs if contact addresses

of the target population are not included in the sampling frame. For example, in the GBP contact

database (which is compiled using Orbis), sole proprietors are undercovered. In 2019, the Orbis database included 254,000 firms that are classified as sole-proprietors and about 237,000 firms with unknown or unrecorded legal status (presumably, a considerable portion of the latter are sole proprietors as well), whereas the official records from the business registry report about 2 million sole-proprietors (*Einzelunternehmer*)[6]. It is likely that those sole-proprietors in the sampling frame differ systematically from their peers who are not included in the database, e.g., because most contact data is eventually derived from the commercial register (Handelsregister). However, registering there is not mandatory for sole proprietors and may therefore be subject to self-selection.

The second type of bias stems from the difference between the sampling frame (or parts of it) and the eventual sample of respondents. This type of nonresponse is typically divided into non-response to the entire questionnaire, e.g., due to refusal or failure to reach the target person (unit nonresponse), and non-response to one or more individual questions, e.g., leaving specific questions unanswered (item nonresponse).

To address potential bias in the estimates due to non-response, we reweight the data using poststratification or raking adjustment approaches (e.g., Battaglia et al., 2009). These methods may prove useful even in the absence of non-response to increase the precision of the estimates by reducing variance. At the same time, we acknowledge that adjustment weighting is not a panacea against non-response, because it rests on demanding data requirements regarding the number of observations per weighting category and strong assumptions (e.g., about the

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[6]   The official registry by the German Federal Statistical Office (Destatis) is available at
       https://www.destatis.de/DE/Themen/Branchen-
       Unternehmen/Unternehmen/Unternehmensregister/Tabellen/unternehmen-rechtsformen-wz08.html.

independence of individual nonresponses; Lohr, 1999). As a standard, we provide weights for adjustment weighting with the GBP data (see section 4.4 for more details). However, researchers remain responsible for generating more appropriate survey weights if this results in a better fit for the purposes of their studies.

Similar to unit-nonresponse, item-nonresponse may bias estimates, for example when asking sensitive questions, for example, about the respondent's propensity to engage in tax avoidance and evasion or earnings management. If non-response is systematic, underreporting of allegedly dubious business practices may bias results. For such cases, particular questioning methods are available, such as list experiments, the randomized response technique or indirect questioning. Another reason for item non-response is questions that are difficult to answer or inappropriate for the respondent population. Instead of an ex-ante filtering of such questions, the GBP offers respondents the option to indicate whether they do not know the answer to the question, whether the question does not apply to their firm, or whether they refuse to answer. We recorded these answers from wave 3 on in the GBP with codes from -9996 through -9998. Dropping out of the survey completely is recorded as well (-9999).

Analyzing these error codes allows us to explore whether the respondents are more willing or able to answer questions on specific topics, e.g., questions on very specific accounting or tax matters. Table 5 presents such an analysis. It shows the error codes depending on the participants' education for three variables: revenue in the previous year, the earnings target of the firm, and earnings management. We expect that we receive a higher refusal rate if a question asks about more specific or sensitive details. In fact, we observe that only less than 5% do not provide a valid answer for the question about revenue in the previous year. This is similar for the earnings target. However, when asked about earnings management, about 30% of respondents

indicate that the question does not apply to their firm. For the first two questions, there is no obvious pattern across education levels. For the question on earnings management, respondents with an apprenticeship as the highest degree are about 10 percentage points less likely to provide a valid answer. The severeness of item non-response and the need for corrective measures thus varies substantially across different types of questions.

4.4.   Representativeness

To evaluate the representativeness of our survey, we benchmark our sample of responding firms against the population of all firms in Germany.[7] This population is tracked by the statistical business register of the Federal Statistical Office (e.g., *AFiD-Panel Unternehmensregister*, URS). The register combines data from the German Federal Employment Agency and fiscal authorities. Reporting the data is mandatory for all firms in Germany and the register is updated annually. While the Federal Statistical Office does not disclose the identity of the firms, the marginal distributions of the legal form, industries, revenues, and employees of the firms included in the registry is available.

Therefore, we use the statistical business register to construct survey weights that help researchers obtain results that are as representative for the target population as possible. Using the raking method (Kolenikov, 2014) and multiple imputation by chained equations algorithms (MICE, Royston and White, 2011), we construct survey weights to calibrate the sample responses to the marginal distributions in the population up to an adjustment error. The survey weights take the following dimensions into account: 1-digit industry level (WZ 2008), region

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[7]   We consider the comparison of our sample with the benchmark population of all firms to be most important and therefore discuss it here in the main body of the text. A comparison of our survey sample and the population of Orbis firms with a valid email address is provided in Appendix B.

(East and West Germany), revenue, and number of employees. Arnemann et al. (2022) provide more details on the construction and use of the GBP survey weights.

Table 6 compares GBP frequencies – before and after applying survey weights – for several key firm characteristics to corresponding frequencies in the 2019 business register of the German Federal Statistical Office. Starting with coverage across industries (coded by letters according to the industry classification; *Klassifikation der Wirtschaftszweige*, *WZ 2008*; provided by the German Federal Statistical Office), the weighted frequencies provide a sensible match with the population benchmark for both waves 1 and 2. However, even the unweighted frequencies correspond reasonably well to their population counterparts, such that industries are covered quite evenly. The information and communication sector and the manufacturing sector are overrepresented in this raw data, while the accommodation and food service sector as well as the professional, scientific, and technical services are underrepresented.

The next two panels of Table 6 show that small firms (in terms of employees and revenues) in particular are underrepresented, whereas the larger types are overrepresented. This becomes apparent when comparing the unweighted relative frequencies for employees and revenue classes with a population share in the first column. One main reason that small firms are underrepresented is the substantial under-coverage of sole proprietorships (see the numbers presented above in Section 4.3), which becomes apparent when the frequencies in the bottom panel are compared across legal forms. Applying survey weights can help correct the unequal representation of different size classes (with respect to e.g., revenue and number of employees) and supports conclusions that are representative for the target population. However, as Table 6 shows, representativity with respect to the legal form (sole proprietors and corporations in particular) remains a challenge even in the weighted data.

4.5 International Comparison

We also evaluate whether the distribution of German firms and of the respondents in our survey are similar to the distributions that we see in other European countries. Given that especially EU member states exhibit similarities in business regulation and societal values, a similar distribution of firms would indicate the transferability of the GBP results. For the purpose of this international comparison, we follow Kalemli-Ozcan et al. (2019) and collect the latest data (for 2018) for all European countries from the Structural Business Statistics provided by Eurostat (SBS).

Table 7 contrasts unweighted relative frequencies from the first two waves of the GBP to the corresponding SBS statistics for the EU27 as a whole (excluding UK) and eight selected individual member states of the European Union. The table has three parts. The first five columns show the relative frequencies of firms broken down by employee size class. As before, in comparison to the data for Germany provided by Eurostat (in bold), the GBP substantially overrepresents larger firms. For example, 8% of the firms in our survey have more than 50 employees, compared to 1% in the overall population (as provided by Eurostat). The other two parts capture the economic importance of firms in different size classes measured by their share in total employment and total revenues. The middle section of the table, columns 6 through 10, reports how the total number of employees is distributed across the five categories of firm size. Finally, the last five columns show the fraction of revenues that is generated by firms in the five different size categories.

Overall, our results are in line with the finding in Kalemli-Ozcan et al. (2019) that most of the gross output and employment are accounted for by small and medium sized enterprises (SMEs). The size pattern of firms is very similar between Germany and France or between

Germany and the UK, while larger firms account for a lower fraction of employees and revenues in Belgium, Finland, Italy and Spain. Overall, the firm size distribution of firms is still sufficiently similar across European countries (with the fraction of employees [revenues] attributable to the largest firms only varying between 31% and 47% [39% and 61%]). Thus, the transferability of GBP results to other European countries appears reasonable.

5.   Survey Results: Implications of the Covid-19 pandemic for firms

This section illustrates how using GBP data can benefit research on questions that require firm-level data on managers' expectations, perceptions, and objectives. To this end, we present an analysis of how the COVID-19 pandemic and the ensuing economic crisis affect German firms. In a first analysis, we shed light on cross-sectional differences in how the Covid-19 pandemic has affected the internal accounting performance of companies in Germany which requires data on internal performance measures and, implicitly, cost structures (see section 2.2 above). The second example exploits GBP data about companies' price-setting intentions. We analyze whether the effects of a temporary VAT cut aligned with the objectives of policy makers in a period of high uncertainty (see section 2.3 above). The descriptive analyses are intended to highlight the suitability of the GBP survey data to contribute to the broader debate on important and unresolved issues in accounting and taxation research.

5.1.   How do the COVID-19 crisis and government aid programs affect accounting performance and managerial perceptions?

Data from the first two survey waves provide insights into the impact of the COVID-19 pandemic on key performance indicators and management decisions during the crisis. The results

also speak to the interrelation between these variables and government aid programs, thus shedding some light on the efficacy of government measures to support companies. For each company, the GBP capture changes in revenues (*ccd1*), changes in profits (*ccd6*), as well as an indicator variable for reported losses (*ccd0*); see https://gbpanel.org/page/data for the variable definitions. This information is an important expansion of existing data because small private companies in Germany, even if obliged to disclose their financial statements as a limited liability company, are exempt from the disclosure of their P&L statements if they fall below a certain size threshold.[8] That is, income statement information remains unobservable for this fairly large number of companies and is not included in commercial databases such as BvD Orbis (Bernard et al., 2018, Beuselinck et al., 2023).

Table 8 presents these indicators for the accounting performance of German companies for the first two survey waves. We list industry averages for the change in profits and revenues of the ten most heavily affected industries and add information on the five industries that experienced the least severe impact. The results confirm the conventional view that industries are hit the hardest when their business model relies on (a) the mobility of people (e.g., airline or train carriers, hotels, travel agencies) or (b) the gathering of large groups of people (e.g., restaurants, entertainment, sport events, trade fairs). The revenues of these companies have been depressed by up to 79.9% (for travel agencies and tour operators) relative to the period before the pandemic spread to Germany. For most industries, the negative impact of the crisis increased during the second survey wave which coincided with the second peak of infection rates in Germany.

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[8]   Under current disclosure regulations (see § 326 German Commercial Code), the exemption applies to limited companies that meet two of the following three criteria: (i) total assets of less than 6m Euros, (ii) total revenues of less than 12m Euros, and (iii) fewer than 50 employees.

Other industries benefit from the consequences of the pandemic. On average, retail sales revenues (both within stores and direct sales) increase, and so do the revenues of chemical companies during the first survey wave. Revenues of the construction industry (both underground engineering and building installation) also surge, pointing to potential benefits of government investments in infrastructure that were intended to foster growth. Further cross-sectional analyses reveal within-industry differences. Retail is an example for an industry that is heterogeneously exposed to the restrictions imposed by the government during the crisis. Some retail stores were allowed to remain open (especially large grocery stores and drugstores) and experienced an increase in profits over the entire year, whereas other specialized stores had to close and experienced an average drop in their profits by 14.5%.

In addition to the performance indicators, the GBP asks managers to assess the expected survival rate in their industry (*cun9*); the last column of Table 8 reports the average estimates for each industry from the first survey wave (July to October 2020). The variable is a useful indicator for an industry-wide level of subjective default risk. We use the variable to evaluate the effectiveness of government aid and contrast an industry's expected survival rate with the expected likelihood of companies from that industry to survive the Corona crisis without any government aid (*cgm20*). If the two expected probabilities match, government aid is redundant as it does not change survival rates in an industry. The larger the difference between these expectations, the more government aid is perceived to increase the likelihood of survival in an industry.[9]

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[9]   We construct this measure by using a hypothetical counterfactual derived from survey participants' perceptions of the fraction of peer firms in their industry that had survived without any government aid. Company survival is a sensitive issue and it is plausible that respondents would not reveal any assessment of their own company without any bias. Indirect questions (such as this one about

At the time of the survey, the government aid program in Germany was a combination of (1) lump sum payments from the Immediate Aid Program ("Soforthilfe-Programm") determined largely by company size (measured by the number of employees) and varying in magnitude across the federal states, (2) federal subsidies for a short-term working allowance enabling companies to reduce fixed personnel costs, and (3) access to subsidized loans granted by state-owned banks such as the German Kreditanstalt für Wiederaufbau (KfW). These programs had in common that the magnitude of the government aid was not directly related to the impact of the pandemic situation on companies' accounting performance.[10]

Figure 1 illustrates the effectiveness of these government aid programs for the 29 industries for which profits decreased the most. The solid line on the upper left is the 45-degree line at which survival rates would exactly correspond – with and without government aid. However, the chart shows that all 29 industries are clearly below that line. In all of these industries which were hit particularly hard by the crisis, government aid was perceived to have some beneficial effect. Across the board, government aid has increased the expected survivability of those 29 industries by an average of 35 percentage points. Looking at individual industries, however, there is high variation in the perception.

On the one hand, there are travel agencies or event service providers whose likelihood to survive increased by 33 and 29 percentage points, respectively, thanks to government aid; on the

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industry peers) are a well-established survey method to reduce such a bias from direct questions (e.g., Dichev et al., 2013). However, the approach by design does not offer perfect counterfactuals for a company's own survival, especially if distressed firms systematically misperceive the industry rates. Therefore, our interpretation exclusively relies on the differences between the two rates.

[10] The federal aid from the Bridging Assistance program ("Überbrückungshilfe") becoming effective in January 2021 changed this approach with government aid then becoming a function of a company's actual cost burden attributable to the pandemic situation.

other hand, their expected rates remain 22 and 27 points below those of publishing houses and 25 and 30 points below those of private schools. Hence, the numbers support the notion that government aid programs during this initial phase of the pandemic did not help companies in all industries to manage their survival to the same extent. The inequality of how firms benefitted from government aid programs is a general concern with many programs and these problems certainly generalize well beyond the particular setting of aid programs in Germany (e.g., Alekseev et al., 2023; Granja et al., 2022).

5.2. *How does a temporary VAT cut affect firms' price policies?*

Tax policy is a widely used tool to stimulate the economy in times of crisis. A temporary cut in the VAT is one example of such a policy. For instance, in the face of a global financial crisis, the UK government reduced the VAT standard rate from 17.5% to 15% between December 2008 and December 2009. Such a temporary cut in the VAT rate is generally expected to support the economy through a channel where consumers are motivated to spend during the crisis period, rather than waiting until post-crisis times (Crossley et al. 2009). Obviously, this mechanism will only come into effect if the temporary VAT cut indeed reduces consumption prices in the crisis period, relative to the post-crisis period when the VAT rate is back to normal. Since firms can choose to pass on the reduced VAT rate to consumers in the form of lower consumption prices or to leave prices constant (which would increase their profit margin per unit sold with a reduced VAT rate), it is eventually an empirical question whether the reduced VAT rate comes with lower consumption prices.

To mitigate the economic impact of the COVID-19 pandemic, the German government reduced the regular VAT rate from 19% to 16% and the reduced rate from 7% to 5% for the period between July 1 and December 31, 2020. Consistent with the expected economic

mechanism mentioned above, boosting private consumption via lower consumption prices was the stated objective of this tax policy.

Two studies show that gasoline stations and supermarkets passed on the tax cut almost fully to consumers by means of lower final consumption prices (Montag et al. 2020). This is a first, and timely, piece of evidence suggesting that the policy can potentially work as policy makers intended. However, gasoline stations and supermarkets are of course special retail sectors and do not necessarily represent the economy as a whole or other industries, and the pandemic did not hit them as heavily as other industries. In addition, these two retail sectors offer goods that are usually fairly inelastic to price changes (at least in the short run) and, compared to other consumption goods such as televisions or cell phones, it is much less plausible that consumers prepone their consumption of gasoline and groceries that they initially planned for at a later point. Therefore, it remains unclear whether the results from these studies can be extrapolated to other industries and retail sectors. While access to administrative price data for goods sold at gasoline stations and in supermarkets is generally possible, data are lacking on consumption prices for most other industries and retail sectors. Data that are available in real time are even rarer, albeit necessary to evaluate the policy in the short run and, for example, estimate the effects of the prolongation of such a VAT reduction.

Data from firm surveys can address the availability challenges, as well as the (short-term) timing of availability, of archival consumption-price data. To provide this evidence, the GBP asked firms during its first wave whether they had any plans to change final prices for the relevant period between July and December 2020, and, if so, by how much. While consumption prices can change for many reasons, any stated adjustments in consumption prices are not necessarily fully attributable to the VAT reduction (because we lack a control group). Our results

are still able to shed light on the question of whether consumption prices went down (consistent with the policy goals) during the relevant time period. We intentionally did not explicitly ask about the pass-through of the VAT cut, because we were concerned that, given the publicly debated concern that firms would use the VAT cut to increase their profit margins, survey respondents would not honestly reveal to which extent they passed on the VAT cut to prices.

Our data show that 25.1% of all firms indicated that they implemented, or plan to implement, adjustments to consumption prices in the period between July and December 2020. Among those indicating such an adjustment, the average price adjustment was 1.8 percentage points. Taken together, these findings imply that the overall price adjustment (across all firms) was relatively low and that consumption prices were quite stable during this time period.

However, we observe large heterogeneity across industries. This heterogeneity underlines the importance of looking at the entire economy, rather than single specific industries (such as supermarkets or gas stations). Table 9 shows the share of firms within selected industries which indicated that they were to change consumption prices, along with the average price adjustment among price changers. More than one third of all firms in the Accommodation (36%) and Food & Beverage (34%) sectors indicated plans to change prices. While the average price change among these firms is close to zero in Accommodation (because some firms increased prices and others reduced them), we observe that price changing firms in Food & Beverage even increase prices by an average of 7.0 percentage points. The latter result suggests that firms in Food & Beverage were able to pass on pandemic-induced cost pressure to consumers. The share of price changing firms is particularly high in retail. 40% of firms responded that they would change consumption prices. Among them, the average change was a price reduction of 2.5 percentage points. Because we lack a control group in our study, it is difficult to make causal statements

about the price effect of the VAT. However, the average price reduction suggests that the VAT reduction was passed on to consumers. Overall, our results suggest that prices were relatively stable with 3 out of 4 firms not changing any prices at all and that firms in some heavily affected sectors even increased prices.

An important limitation of this exercise is that we cannot rule out the possibility that some firms considered net prices rather than gross prices when they responded to our survey question. Our analysis rests on the assumption that firms referred to gross prices that consumers eventually have to pay. The wording of the question eliciting the price change was: "By how much have you changed or are you planning to change the prices of your end products between July 1st and December 31st, 2020?" When designing the survey question, we decided to use the term "end product" (German: "Endprodukt") with the intention that this term would induce firms to consider the price they put on their price tag in a B2C situation (note that in Germany price tags show the gross price including VAT). We wanted to avoid the terms "gross" and "net" to reduce the complexity of the question and to make sure that respondents are not confused by terms that they potentially do not know. However, we acknowledge that the downside of the complexity reduction is that it was not clear to some respondents whether we refer to gross or net prices.

To shed light on the question of whether firms thought in terms of net or gross prices and to validate our data, the last column in Table 9 reports industry-level ex-post inflation rates from national statistics as a benchmark for the price change responses from the GBP survey in the middle column. In general, the intended price changes are very similar to the realized inflation rates, supporting the notion that firms reported in terms of gross prices, rather than net prices. Exceptions are Food & Beverage and Construction which realize much lower price increases

according to ex-post statistics than they planned for during the first survey wave ex ante. This can reflect measurement error but could also point to a lack of pricing power when the situation deteriorated during the second half of the year with new COVID-19 restrictions coming into effect.[11]

6.   Outlook

6.1 Data access and user guides

The GBP aims to follow the Open Science principles and the FAIR data principles.[12] Therefore, all researchers have access to the GBP data in three different ways. All three access options fully comply with all relevant data protection laws and also meet the survey participants' expectations regarding data security. To this end, the GBP developed a detailed data protection concept in collaboration with the data protection officer of the University of Mannheim, specifying the control of physical access to the data servers, data encryption, and monitoring during access (e.g., through surveillance cameras).

Public Use Files (PUFs): Upon request, the GBP makes anonymized microdata available for scientific research in the form of Public Use Files (PUFs). To fully ensure anonymization, the PUFs include selected, aggregated characteristics. Therefore, researchers can only perform spatial analyses on the basis of the PUFs at the level of the federal states.

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[11]   The Statistical Office includes a notice with the monthly price index for restaurants that it is not reliable from November 2020 until April 2021 due to high statistical uncertainty. In the subsequent month, the time series then exhibits an abrupt 2 percentage point jump.

[12]   FAIR is short for "findable, accessible, interoperable, reusable"; see Wilkinson et al. (2016).

Remote data processing: Researchers who require more granular and sensitive data can take advantage of controlled remote access to the raw data. The GBP provides structure files on its website (https://gbpanel.org/page/datensatze) that can be used for the preparation and testing of codes prior to submission. These files retain the structure of the variables of the original data (i.e., the identical variable names and value labels) but they aggregate or exclude sensitive features. The raw figures from each observation are randomly altered, such that evaluations across variables are not possible with the structure data itself. The randomized generation of the structure files retains the distribution of the original variables up to sampling error. This allows for an exploration of statistics like mean, median or standard deviation without disclosure control. A variable indicating the individual survey waves in the structure files is available for longitudinal analyses.

On-site access: To forgo the typical time lag inherent to remote data processing and facilitate immediate adjustments of programming codes, researchers can also access the GBP data on-site (with the same sensitive data included in the structure file). For instance, the datasets we use in the analyses for this paper are available at the On-Site-Secure-Data-Center of GESIS in Cologne[13].

The latter two methods of data access require a data user contract, including a declaration of confidentiality. They allow for both a detailed regional analysis on the district, county, and municipality level and for external data sources to be linked (see below). For example, it is possible to link regional data through the official municipality key (AGS) or industry data using the NACE Rev. 2 classification. The GBP provides user guides for the AGS and the industry classification.

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[13]   More information is available on the GESIS website: https://search.gesis.org/research_data/ZA7746.

6.2 Linkage with Other Data Sources

The GBP offers various possibilities for users to augment the core data with information from external databases. For example, GBP provides the industry classification of all industries following the so-called *Klassifikation der Wirtschaftszweige* (WZ 2008) of the German Federal Statistical Office. This classification is compatible with the Statistical Classification of Economic Activities in the European Community (Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) Revision 2). The NACE code allows researchers to link the GBP data with further information on industry characteristics. The GBP data are also compatible with international data infrastructures. Key infrastructures are the Bureau van Dijk (BvD) or Bisnode databases. For example, the GBP includes an additional identifier, BvDID, that can be used for a merge with data from Orbis, Amadeus, or Dafne. Similarly, it is possible to link the data to the business register of the German Federal Statistical Office, Creditreform records, or the Mannheim Enterprise Panel. Generally, linkage with external data sources on the firm level is only possible for those responses where the survey participant agreed to linking the data in accordance with relevant data protection laws.

6.3.   Future Waves and Opportunities for Panel Data Analyses

Future survey waves of the GBP will center on various topics in the context of accounting and taxation. A particular focus will be on questions that are either difficult to address with conventional data sources or, to track the economy and provide input for policy and public debates, that are not available with high frequency. For example, we will survey standard firm performance indicators on a high-frequency basis (with a focus on aspects of accounting and taxation) and exploit our rolling sampling to address contemporaneous developments in a timely

manner. We present details on selected research questions that can be addressed with survey data above in Sections 1 and 2.

6.4.   *Submission of Own Research Questions and Survey Experiments*

The GBP offers an opportunity for researchers to submit proposals for new questions (the GBP Submission Module, with one annual deadline typically in November). If approved, the proposed questions will be included as new instruments in the regular GBP surveys or, as a short-term project, for a limited period (typically up to six months). The GBP Submission module can also accommodate experiments and provides a platform for innovative survey instruments. To ensure data quality, submissions are required to pre-register an analysis plan. Submitting researchers will have exclusive access to the data from the GBP Submission module for an initial 12-month period. Afterwards, the data will be released using the regular process.[14]

Data availability: The data that supports the findings of this study are openly available in the GESIS Data Archive at https://doi.org/10.4232/1.13731, study #ZA7746.

Supplemental Data and Research Materials: Supplemental data for this article can be accessed on the Taylor & Francis website at https://doi.org/10.1080/09638180.2024.2403467.

Online Appendix A. Further Details on Sampling and Survey Methodology.

Online Appendix B. Conceptualizing and Addressing Biases.

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[14]   The GBP website includes an overview: https://gbpanel.org/page/frage-einreichen/

References

Alekseev, G., Amer, S., Gopal, M., Kuchler, T., Schneider, J.W., Stroebel, J., & Wernerfelt, N. (2023). The Effects of COVID-19 on U.S. Small Businesses: Evidence from Owners, Managers, and Employees. *Management Science*, 69(1), 7-24. https://doi.org/10.1287/mnsc.2022.4327

Angelini, P., & Generale, A. (2008). On the evolution of firm size distributions. *American Economic Review*, 98(1), 426–438. https://doi.org/10.1257/aer.98.1.426

Arnemann, L., Eble, F., Bischof, J., Dörrenberg, P., Rostam-Afschar, D., Simons, D., & Voget, J. (2022). *A Guide on How Survey Weights of the GBP are Used (and Constructed)*. GBP. https://backend.gbpanel.org/app/uploads/2022/07/ Information_Leaflet_Weights_final_2022_01_19.pdf

Ball, R. (2013). Accounting Informs Investors and Earnings Management is Rife: Two Questionable Beliefs. *Accounting Horizons*, 27(4), 847-853. https://doi.org/10.2308/acch-10366

Banker, R.D., & Byzalov, D. (2014). Asymmetric Cost Behavior. *Journal of Management Accounting Research*, 26(2), 43-79. https://doi.org/10.2308/jmar-50846

Barry, J.W., Campello, M., Graham, J.R., & Ma, Y. (2022). Corporate flexibility in a time of crisis. *Journal of Financial Economics*, 144(3), 780-806. https://doi.org/10.1016/j.jfineco.2022.03.003

Battaglia, M. P, Hoaglin, D.C., & Frankel, M.R.. (2009). Practical Considerations in Raking Survey Data. *Survey Practice* 2 (5). https://doi.org/10.29115/SP-2009-0019

Becker, K., Bischof, J., & Daske, H. (2021). IFRS: Markets, Practice, and Politics. *Foundations and Trends in Accounting*, 15(1-2), 1-262. https://doi.org/10.1561/1400000055

Bernard, D., Burgstahler, D., & Kaya, D. (2018). Size Management by European Private Firms to Minimize Proprietary Costs of Disclosure. *Journal of Accounting and Economics*, 66(1), 94-122. https://doi.org/10.1016/j.jacceco.2018.03.001

Beuselinck, C., Elfers, F., Gassen, J., & Pierk J. (2023). Private firm accounting: the European reporting environment, data and research perspectives. *Accounting and Business Research*, 53(1), 38-82. https://doi.org/10.1080/00014788.2021.1982670

Bhojraj, S., Bloomfield, R.J., Jang, Y., & Yehuda, N. (2021). Cost structure, operating leverage, and CDS spreads. *The Accounting Review*, 96(5), 79-105. https://doi.org/10.2308/TAR-2018-0497

Bischof, J., Karlsson, C., Rostam-Afschar, D., Simon, T., & Simons, D. (2022). Kostenstruktur und Unternehmensflexibilität in der COVID-19-Krise. *Controlling & Management Review*, 66(7), 54-59. https://doi.org/10.1007/s12176-022-0497-7

Bischof, J., Laux, C., & Leuz, C. (2021). Accounting for Financial Stability: Bank Disclosure and Loss Recognition in the Financial Crisis. *Journal of Financial Economics*, 141(3), 1188-1217. https://doi.org/10.1016/j.jfineco.2021.05.016

Bloom, N., Bunn, P., Chen, S., Minzen, P., & Smietanka, P. (2020). *The Economic Impact of Coronavirus on UK Businesses: Early Evidence from the Decision Maker Panel.* https://voxeu.org/article/economic-impact-coronavirus-uk-businesses.

Bloomfield, R., Nelson, M. W., & Soltes, E. (2016). Gathering data for archival, field, survey, and experimental accounting research. Journal of Accounting Research, 54(2), 341-395. https://doi.org/10.1111/1475-679X.12104

Brogaard, J., Dai, L., Ngo, P.T., & Zhang, B. (2020). Global political uncertainty and asset prices. *The Review of Financial Studies*, 33(4), 1737-1780. https://doi.org/10.1093/rfs/hhz087

Burgstahler, D.C., Hail, L., & Leuz, C. (2006). The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms, *The Accounting Review*, 81(5), 983-1016. https://doi.org/10.2308/accr.2006.81.5.983

Coibion, O., Georgarakos, D., Gorodnichenko, Y., Kenny, G., & Weber, M. (2021). *The Effect of Macroeconomic Uncertainty on Household Spending* (No. w28625). National Bureau of Economic Research. https://doi.org/10.2866/19326

Crossley, T., Low, H., & Wakefield, M. (2009). The economics of a temporary VAT cut. *IFS Working Paper* W09/02. https://doi.org/10.1111/j.1475-5890.2009.00086.x

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding Earnings Quality. *Journal of Accounting and Economics*, 50(2-3), 344-401. https://doi.org/10.1016/j.jacceco.2010.09.001

DeFond, M. (2015). Annual Report and Editorial Commentary. *The Accounting Review*, 90(6), 2603-2638. https://doi.org/10.2308/accr-10477

Deutsche Bundesbank (2021). Assessments and expectations of firms in the pandemic: Findings from the Bundesbank Online Panel. Available online: https://www.bundesbank.de/resource/blob/864912/6ea34f75ea9534b8231b4cfecfddfc3d/mL/2021-04-unternehmen-pandemie-data.pdf

Dichev, I.D., Graham, J.R., Harvey, C.R., & Rajgopal, S. (2013). Earnings Quality: Evidence from the Field. *Journal of Accounting and Economics*, 56(2-3), 1-33. https://doi.org/10.1016/j.jacceco.2013.05.004

Dillon, R.D., & Nash, J.F. (1978). The True Relevance of Relevant Cost. *The Accounting Review*, 53(1), 11-17.

Ewert, R., & Wagenhofer, A. (2011). Earnings Management, Conservatism, and Earnings Quality. *Foundations and Trends in Accounting*, 6(2), 65–186. https://doi.org/10.1561/1400000025

Fahlenbrach, R., Rageth, K., & Stulz, R.M. (2021). How valuable is financial flexibility when revenue stops? Evidence from the Covid-19 crisis. *Review of Financial Studies*, 34(11), 5474–5521. https://doi.org/10.1093/rfs/hhaa134

Garcia Lara, J.M., Garcia Osma, B., & de Albornoz Noguer, B.G. (2006). Effects of database choice on international accounting research. *Abacus*, 42(3-4), 426-454. https://doi.org/10.1111/j.1467-6281.2006.00209.x

Gassen, J., & Muhn, M. (2024). Financial transparency of private firms: Evidence from a randomized field experiment. *Journal of Accounting Research*, forthcoming. https://doi.org/10.1111/1475-679X.12568

Gerakos, J. (2012). Discussion of detecting earnings management: A new approach. *Journal of Accounting Research*, 50(2), 335-347. https://doi.org/10.1111/j.1475-679X.2012.00452.x

Gerakos, J., & Kovrijnikh, A. (2013). Performance Shocks and Misreporting. *Journal of Accounting and Economics*, 56(1), 57-72. https://doi.org/10.1016/j.jacceco.2013.04.001

Graham, J.R., Hanlon, M., & Shevlin, T. (2011). Real Effects of Accounting Rules: Evidence from Multinational Firms' Investment Location and Profit Repatriation Decisions. *Journal of Accounting Research*, 49(1), 137-185. https://doi.org/10.1111/j.1475-679X.2010.00395.x

Graham, J.R., Hanlon, M., Shevlin, T., & Shroff, N. (2014). Incentives for Tax Planning and Avoidance: Evidence from the Field, *The Accounting Review*, 89(3), 991-1023. https://doi.org/10.2139/ssrn.2148407

Graham, J.R., Hanlon, M., Shevlin, T. & Shroff, N. (2017). Tax Rates and Corporate Decision-making. *The Review of Financial Studies*, 30(9), 3128–3175. https://doi.org/10.1093/rfs/hhx037

Graham, J.R., Harvey, C.R., & Rajgopal S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40, (1-3), 3-73. https://doi.org/10.1016/j.jacceco.2005.01.002

Granja, J., Makridis, C., Yannelis, C., & Zwick, E. (2022). Did the Paycheck Protection Program Hit the Target? *Journal of Financial Economics*, 145(3), 725-761. https://doi.org/10.1016/j.jfineco.2022.05.006

Ho, H., Hofmann, C., & Schwaiger, N. (2023). The COVID-19 Pandemic and Management Controls. *Accounting and Business Research*, 53(5), 583-607. https://doi.org/10.1080/00014788.2023.2219158

Jacob, M., Wentland, K., & Wentland, S.A. (2022). Real effects of tax uncertainty: Evidence from firm capital investments. *Management Science*, 68(6), pp.4065-4089. https://doi.org/10.1287/mnsc.2021.4072

Jaedicke, R.K., & Robichek, A.A. (1964). Cost-Volume-Profit Analysis under Conditions of Uncertainty. *The Accounting Review*, 39(4), 917-926.

Kalemli-Ozcan, S., Sorensen, B., Villegas-Sanchez, C., Volosovych, V., & Yesiltas, S. (2019). *How to construct nationally representative firm level data from the Orbis global database: New facts and aggregate implications* (No. w21558). National Bureau of Economic Research. https://doi.org/10.1257/mac.20220036

Kolenikov, S. (2014). Calibrating Survey Data Using Iterative Proportional Fitting. *Stata Journal*, 14(1), 22-59. https://doi.org/10.1177/1536867X1401400104

Labro, E. (2019). Costing Systems. *Foundations and Trends in Accounting*, 13(3-4), 267-404. https://doi.org/10.1561/1400000058

Leuz, C., & Wysocki, P.D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research,* 54(2), 525-622. https://doi.org/10.1111/1475-679X.12115

Minnis, M., & Shroff, N. (2017). Why regulate private firm disclosure and auditing? *Accounting and Business Research*, 47(5), 473-502. https://doi.org/10.1080/00014788.2017.1303962

Montag, F., Sagimuldina, A., & Schnitzer, M. (2020). *Are temporary value-added tax reductions passed on to consumers? Evidence from Germany's stimulus*. Centre for Economic Policy Research. https://doi.org/10.48550/arXiv.2008.08511

Nelson, M.W., & Skinner, D.J. (2013). How should we think about earnings quality? *Journal of Accounting and Economics*, 56(2-3), 34-41. http://doi.org/10.1016/j.jacceco.2013.10.003

Poschke, M. (2018). The firm size distribution across countries and skill-biased change in entrepreneurial technology. *American Economic Journal: Macroeconomics*, 10(3), 1-41. http://doi.org/10.1257/mac.20140181

Rehse, D., Riordan, R., Rottke, N., & Zietz, J. (2019). The effects of uncertainty on market liquidity: Evidence from Hurricane Sandy. *Journal of Financial Economics*, 134(2), 318-332. https://doi.org/10.1016/j.jfineco.2019.04.006

Robinson, J.R., Sikes, S.A., & Weaver, C.D. (2010). Performance measurement of corporate tax departments. *The Accounting Review*, 85(3), 1035-1064. https://doi.org/10.2308/accr.2010.85.3.1035

Rostam-Afschar, D. (2020). Inklusive Beschäftigungspolitik: Fakten, Herausforderungen und neue Ideen zur Regulierung von Berufen. *Zeitschrift für Wirtschaftspolitik*, 69(2), 129-139. https://doi.org/10.1515/zfwp-2020-2034

Royston, P., & White, I.R. (2011). Multiple Imputation by Chained Equations (MICE): Implementation in Stata. *Journal of Statistical Software*, 45(4), 1-20. http://doi.org/10.18637/jss.v045.i04

Snijkers, G., Haraldsen, G., Jones, J., & Willimack, D. (2013). *Designing and conducting business surveys.* John Wiley & Sons. http://doi.org/10.1002/9781118447895

van der Stede, W. A., Young, S. M., & Chen, C. X. (2005). Assessing the quality of evidence in empirical management accounting research: The case of survey studies. *Accounting, Organizations and Society*, 30(7-8), 655-684. http://doi.org/10.1016/j.aos.2005.01.003

Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. (2016). The FAIR Guiding Principles for Scientific Data Management and Stewardship. *Scientific Data*, 3(1), 1-9. http://doi.org/10.1038/sdata.2016.18

Tables and Figures

Table 1: Respondent Characteristics by Firm Size

	Micro	Small	Medium	Large	No Size	Total
Gender						
Male	79.6	80.1	84.3	82.5	74.4	79.9
Female	20.4	19.9	15.7	17.5	25.6	20.1
Position						
Owner/CEO	96.2	92.4	89.5	78.8	91.9	94.1
Department Head	2.5	5.2	9.1	17.4	4.6	4.1
Clerk	1.3	2.4	1.5	3.8	3.6	1.7
Education						
No degree	2.2	1.9	1.2	1.9	1.6	2.0
Other degree	7.5	5.7	5.6	6.0	8.8	6.9
Apprenticeship	17.4	16.2	13.8	9.5	13.8	16.5
Bachelor (university)	6.2	7.1	7.5	4.1	7.8	6.5
Master craftsperson, technician	14.4	14.4	10.2	6.0	9.6	13.7
Master (university)	46.0	48.1	53.6	63.1	50.4	47.7
PhD or higher	6.3	6.5	8.0	9.5	8.0	6.7

Table 1 reports the relative distribution of respondent characteristics in percent within categories of firm size observed in the German Business Panel, wave 1 (July – October 2020) and wave 2 (November 2020 – July 2021). We follow the definition of the European Commission for micro, small and medium-sized firms (EU Recommendation 2003/361) using the number of employees and revenues. Micro refers to up to 2 million Euro revenues and up to 9 employees, small denotes up to 10 million Euro revenues and up to 49 employees, medium up to 50 million Euro revenues and up to 49 employees. All firms exceeding the threshold for medium are classified as large. Firms with missing revenue or employees are classified under no size. No weighting is applied.

Table 2: COVID-19 as a Source of Uncertainty for Own Business, % of Respondents

	GBP Covid-19 Survey (unweighted)	GBP Covid-19 Survey (weighted)	Bloom et al. (2021) Decision Maker Panel (November 2020 - April 2021)
Very Low	3.8	4.2	0.5
Low	6.7	6.3	4.9
Medium	28.3	26.7	33.5
High	32.6	32.0	35.0
Very High	28.6	30.8	26.1

Table 2 shows the perceived degree of uncertainty for the own business (Likert scale from very low to very high) due to Covid-19. The data is derived from the German Business Panel (GBP), wave 2 (November 2020 – July 2021), and the Bloom et al. (2021) Decision Maker Panel (November 2020 - April 2021). The sample includes 8,365 firm-level observations. The data is weighted using the weights provided by the GBP. The table uses the following variable from the GBP: cun8 (see the GBP Codebooks in Appendix C for more information).

Table 3: Earnings Management in the GBP and the Dichev et al. (2013) CFO Survey

	GBP		Dichev et al. (2013)	
	N	Mean	N	Mean
% of companies managing earnings	10,009	19.15%	357	24.92%
% of companies managing earnings upwards (vs. downwards)	10,009	33.56%	360	57.40%

Table 3 shows the share of companies engaging in earnings management (% of companies managing earnings) and, among these companies, the share of companies engaging in upward earnings management (in contrast to downward earnings management). The data is derived from the German Business Panel (GBP), wave 2 (November 2020 – July 2021), and Dichev et al. (2013). The sample includes 10,009 firm-level observations in the GBP and between 357 and 360 firm-level observations from Dichev et al. (2013). The means for Dichev et. al. (2013) are weighted with the number of observations, e.g., 163/360 x 58.78 + 197/360 x 56.25. The table uses the following variable from the GBP: em1 (see the GBP Codebooks I Appendix C for more information).

Table 4: Comparison Between Survey Responses and Orbis Information

		Revenue Categories (% of 923) in ORBIS (2019)			
		0–2 Mio. Euro	2–10 Mio. Euro	10–50 Mio. Euro	>50 Mio. Euro
GBP Survey	0–2 Mio. Euro	73.7	2.7	0.0	0.3
	2–10 Mio. Euro	4.3	11.6	0.0	0.0
	10–50 Mio. Euro	1.5	0.2	3.1	0.1
	>50 Mio. Euro	0.4	0.2	0.4	1.3
		Employee Categories (% of 2,915) in ORBIS (2019)			
		0–9	10–49	50–249	> 250
GBP Survey	0–9	62.4	6.1	0.0	0.0
	10–49	8.2	15.4	0.5	0.0
	50–249	2.2	0.8	2.6	0.1
	> 250	0.8	0.2	0.3	0.4

Table 4 reports the relative frequency of firms in two cross-tabulated size categories. The rows correspond to annual revenue and number of employees reported by firms in the German Business Panel survey. The columns correspond to annual revenue and number of employees contained in Orbis. The data sources are the German Business Panel (GBP), wave 1 (July – October 2020), and Orbis data (2019). The sample includes 923 firm-level observations for the revenue categories and 2,915 firm-level observations for the employee categories. The table uses the following variables from the GBP: ccgic3, ccgic6 (see the GBP Codebooks in Appendix C for more information).

Table 5: Item-Nonresponse by Education

| | Revenues in previous year | | | | | |
	Dropout -9999	Refusal -9998	Do not know -9997	Does not apply -9996	Valid answer	N
Education						
No degree	1.6	0.0	0.0	0.0	98.4	64
Other degree	1.5	0.8	0.0	2.3	95.5	266
Apprenticeship	1.0	0.3	0.0	0.7	98.0	715
Bachelor (university)	1.3	0.3	0.0	1.6	96.8	311
Master craftsperson, technician	1.1	0.3	0.0	0.4	98.3	744
Master (university)	0.9	0.6	0.0	1.1	97.4	2,037
PhD, Habilitation	2.3	0.0	0.0	2.0	95.6	298
						4,435
	Earnings target					
	Dropout -9999	Refusal -9998	Do not know -9997	Does not apply -9996	Valid answer	N
Education						
No degree	0.0	0.0	0.0	0.0	100.0	6
Other degree	2.9	0.0	0.0	0.0	97.1	34
Apprenticeship	2.1	0.0	0.0	0.0	97.9	95
Bachelor (university)	2.0	0.0	0.0	0.0	98.0	49
Master craftsperson, technician	2.0	0.0	0.0	0.0	98.0	101
Master (university)	3.5	0.0	0.0	0.0	96.5	259
PhD, Habilitation	5.4	0.0	0.0	0.0	94.6	37
						581
	Earnings management					
	Dropout -9999	Refusal -9998	Do not know -9997	Does not apply -9996	Valid answer	N
Education						
No degree	0.0	0.0	0.0	0.0	100.0	6
Other degree	0.0	0.0	0.0	35.3	64.7	34
Apprenticeship	1.1	0.0	0.0	35.8	63.2	95
Bachelor (university)	0.0	0.0	0.0	36.7	63.3	49
Master craftsperson, technician	1.0	0.0	0.0	26.7	72.3	101
Master (university)	0.8	0.0	0.0	29.3	69.9	259
PhD, Habilitation	0.0	0.0	0.0	27.0	73.0	37
						581

Table 5 reports the relative frequencies (in percent) of non-response categories and valid responses to survey questions in wave 3 of the German Business Panel (June – December 2021). All 4,435 participants received the question on previous year's revenues, but only a randomly drawn subsample of 581 participants received the questions on earnings target and earnings management. No weighting is applied.

Table 6: Distribution of Firm Characteristics in the GBP vs. Target Population

	Statistical Register (2019)	Survey Wave 1		Survey Wave 2	
		Unweighted	Weighted	Unweighted	Weighted
Industries					
(B) Mining and quarrying	0.1	0.2	0.1	0.4	0.1
(C) Manufacturing	6.4	11.9	6.4	17.3	6.7
(D) Electricity, gas, steam and air conditioning supply	2.2	1.4	2.0	0.6	1.4
(E) Water supply; sewerage, waste management and remediation activities	0.3	0.5	0.3	0.5	0.4
(F) Construction	11.0	7.0	10.5	6.5	11.2
(G) Wholesale and retail trade; repair of motor vehicles and motorcycles	17.1	15.8	16.9	14.7	17.3
(H) Transportation and storage	3.2	2.4	3.2	2.7	3.4
(I) Accommodation and food service activities	7.1	4.2	6.7	5.1	5.8
(J) Information and communication	3.9	13.7	4.0	12.6	4.2
(K) Financial and insurance activities	2.1	3.2	2.1	3.6	2.3
(L) Real estate activities	5.3	3.3	5.1	2.9	5.3
(M) Professional, scientific and technical activities	15.0	11.5	14.9	13.1	15.5
(N) Administrative and support service activities	6.4	7.6	6.5	6.9	7.3
(P) Education	2.3	1.5	2.2	2.3	2.3
(Q) Human health and social work activities	7.1	5.0	6.9	2.6	4.8
(R) Arts, entertainment and recreation	3.4	4.0	3.4	3.2	3.6
(S) Other service activities	6.9	4.7	6.8	3.0	6.2
Total	3,559,197		10,174		7,200
Number of Employees subject to Social Security					
0 to 9 employees	87.4	65.5	87.1	67.3	86.6
10 to 49 employees	10.1	25.6	10.3	24.7	10.7
50 to 249 employees	2.1	6.5	2.1	6.4	2.2
250 and more employees	0.5	2.4	0.5	1.7	0.5
Total	3,559,197		10,076		7,719

Revenues

below 2 million	93.2	75.5	92.9	77.2	92.8
2 to 10 million	5.1	16.6	5.3	16.0	5.4
10 to 50 million	1.3	5.3	1.4	4.9	1.4
50 million and more	0.4	2.5	0.4	1.8	0.4
Total	3,559,197		9.982		8,485

Legal Form

Sole proprietorship	60.9	11.2	14.2	12.9	16.2
Corporation	21.3	70.9	68.0	67.9	64.6
Partnership	11.3	13.8	12.8	13.2	11.6
Other legal form	6.4	4.1	4.9	5.9	7.6
Total	3,559,197		10,156		8,570

Table 6 shows the share of firms in each category of industry, employment size class, revenue class, and legal form. The data is derived from the German Business Panel (GBP), wave 1 (July – October 2020) and wave 2 (November 2020 – July 2021), and the legal form from the German Federal Statistical Office (Statistisches Bundesamt (Destatis)) for the 2019 reporting period. The sample includes 10,174 and 8,570 firm-level observations (including industries classified as A, O, T, and U) in the GBP for Survey Wave 1 and 2, and 3,559,197 firm-level observations in the Business Register. The data is weighted using the weights provided by the GBP. The table uses the following variables from the GBP: ccgic1, ccgic3, ccgic6, industry_WZ08 (see the GBP Codebooks in Appendix C for more information).

Table 7: Firm Size Distributions in GBP Sample and according to Eurostat

	Distribution of Firm Frequencies by Size					Distribution in Terms of Employment by Size					Distribution in Terms of Turnover by Size				
	0 to 9	10 to 19	20 to 49	50 to 249	>250	0 to 9	10 to 19	20 to 49	50 to 249	>250	0 to 9	10 to 19	20 to 49	50 to 249	>250
GBPW1	0.66	0.14	0.11	0.06	0.02	0.07	0.06	0.12	0.30	0.44	0.04	0.02	0.05	0.14	0.75
GBPW2	0.67	0.14	0.11	0.06	0.02	0.07	0.07	0.12	0.32	0.42	0.04	0.13	0.07	0.06	0.69
EU27	0.93	0.04	0.02	0.01	0.00	0.29	0.09	0.11	0.16	0.35	0.16	0.07	0.10	0.18	0.49
BE	0.95	0.03	0.01	0.01	0.00	0.34	0.08	0.10	0.14	0.35	0.23	0.09	0.11	0.18	0.39
DE	**0.83**	**0.09**	**0.05**	**0.02**	**0.00**	**0.19**	**0.11**	**0.12**	**0.17**	**0.41**	**0.10**	**0.06**	**0.08**	**0.15**	**0.61**
DK	0.88	0.06	0.04	0.02	0.00	0.25	n/a	n/a	0.28	0.47	0.20	n/a	n/a	0.26	0.54
ES	0.94	0.03	0.02	0.01	0.00	0.36	0.09	0.11	0.13	0.31	0.20	0.08	0.11	0.17	0.44
FI	0.91	0.05	0.03	0.01	0.00	0.23	0.10	0.13	0.19	0.35	0.15	0.07	0.11	0.22	0.45
FR	0.96	0.02	0.01	0.01	0.00	0.25	0.07	0.08	0.13	0.47	0.16	0.05	0.07	0.13	0.59
UK	0.90	0.05	0.03	0.01	0.00	0.19	0.08	0.11	0.16	0.46	0.17	0.06	0.08	0.15	0.53
IT	0.96	0.03	n/a	0.01	n/a	0.64	0.16	n/a	0.20	n/a	0.43	0.19	n/a	0.38	n/a

Table 7 presents the frequency distribution of companies across size categories of 0 to 9, 10 to 19, 20 to 49, 50 to 249 and above 250 employees, the distribution of employees and the distribution of revenues across the same size clusters. The data is derived from the German Business Panel (GBP), wave 1 (July – October 2020) and wave 2 (November 2020 – July 2021), and from Eurostat (2018, retrieved on July 27, 2021). Countries are denoted by ISO 3166 ALPHA2 country codes. The sample includes 21,543 firm-level observations. To calculate the distribution of employees, we have used the mid points of the size bins. To calculate the distribution of revenues, we have used the exact amount of revenues (as reported) before aggregating them into the size clusters. The table uses the following variables from the GBP: ccgic2, ccgic6 (see the GBP Codebooks in Appendix C for more information).

Table 8: The Impact of the COVID-19 Crisis by 3-digit Industry

Panel A: Survey Wave 1 (July to October 2020)			
	Change in Revenues	Change in Profits	Survival of Industry
Industries with the most negative impact on revenues:			
Organization of conventions and trade shows	-72.8	-64.1	53.4
Travel agency and tour operator activities	-66.3	-62.8	59.4
Event catering and other food service activities	-60.2	-63.3	62.1
Amusement and recreation activities	-58.9	-59.2	61.9
Other passenger land transport	-58.9	-54.2	70.9
Hotels and similar accommodation	-52.1	-51.8	67.5
Printing and service activities related to printing	-49.9	-48.7	65.8
Beverage serving activities	-47.1	-40.1	61.0
Creative, arts and entertainment activities	-45.8	-46.5	65.3
Sports activities	-44.4	-34.8	76.2
Industries with the most positive impact on revenues:			
Manufacture of other chemical products	7.7	0.9	85.7
Construction of other civil engineering projects	5.2	6.7	87.5
Electrical, plumbing and other construction installation activities	5.0	6.8	87.3
Retail sale of food, beverages and tobacco in specialised stores	2.1	-4.8	76.8
Retail trade not in stores, stalls or markets	1.3	-1.6	78.8

Panel B. Survey Wave 2 (November 2020 to July 2021)

	Change in Revenues	Change in Profits	Survival of Industry
Industries with the most negative impact on revenues:			
Travel agency and tour operator activities	-79.9	-75.7	57.2
Organisation of conventions and trade shows	-75.7	-73.3	52.5
Creative, arts and entertainment activities	-62.0	-55.2	58.3
Hotels and similar accommodation	-54.9	-52.6	61.2
Beverage serving activities	-51.6	-58.0	55.3
Restaurants and mobile food service activities	-46.5	-46.5	60.8
Sports activities	-36.3	-26.9	76.1
Other education	-34.6	-32.6	67.9
Specialised design activities	-31.8	-34.2	62.2
Advertising	-30.4	-34.7	69.9
Industries with the most positive impact on revenues:			
Retail trade not in stores, stalls or markets	11.1	8.9	77.1
Accounting, bookkeeping and auditing activities; tax consultancy	5.4	4.3	90.2
Other specialised construction activities	-0.5	-5.7	80.4
Construction of residential and non-residential buildings	-0.7	-1.4	78.7
Activities auxiliary to insurance and pension funding	-2.5	-0.9	82.2

Table 8 shows the change in revenues, change in profits, and survival of industry in percent for the 3-digit industries that are most and least negatively affected by the Covid-19 pandemic. The data is derived from the German Business Panel (GBP), wave 1 (July – October 2020) and wave 2 (November 2020 – July 2021). The table includes 1,183 firm-level observations in wave 1 and 1,411 in wave 2. The data is weighted using weights provided by the GBP. The table uses the following variables from the GBP: ccd1, ccd6, cun9, industry_WZ08 (see the GBP Codebooks in Appendix C for more information).

Table 9: Changes of Final Consumption Prices (between July and December 2020) in

Selected Industries

Industry	Share of Firms	Average Price Change	Benchmark Comparison
Retail	40.3	-2.5	-2.7
Accommodation	35.7	-0.2	-1.4
Food and beverage	33.7	7.0	0.2
Wholesale	30.3	-1.7	-1.1
Art and Travel	27.8	3.7	4.3
Construction	27.2	4.2	0.3
Legal and accounting services	26.7	3.3	3.1
Manufacturing	25.3	1.2	1.0

Table 9 shows the share of firms that plan to change their prices between July and December 2020 and average price changes for selected industries. The data is derived from the German Business Panel (GBP), wave 1 (July – October 2020). The sample includes 4,251 firm-level observations. The data is weighted using the weights provided by the GBP. The first two columns report the following variables from the GBP: cps1, cps2, which contain the responses to the questions "Have you already changed prices since July 1st or do you plan to change prices for your end products before December 31st, 2020?" and "By how much have you changed or are you planning to change the prices of your end products between July 1st and December 31st, 2020?". The phrasing of the question is meant to ensure that survey participants give responses with respect to gross prices and that all participants consider the price change related to the same time span of six months. See the GBP Codebook in Appendix C for further information on variables. The last column reports the inflation inferred from the most closely related available monthly price index. The first five items are based on the German Federal Statistical Office's monthly consumer price indices: CC13-01, CC13-112, CC13-111, CC13-05, CC13-094. See Statistisches Bundesamt (2023a), Statistisches Bundesamt (2023b), Statistisches Bundesamt (2023c) and Eurostat (2023). For Construction, it is based on the German Federal Statistical Office's quarterly price index for prefab detached houses. For Legal and accounting services, it is based on the German Federal Statistical Office's quarterly producer price index for services, WZ08-69-03. For Manufacturing, it is based on Germany's monthly industrial producer price index (excluding construction) STS-INPP_M by Eurostat.

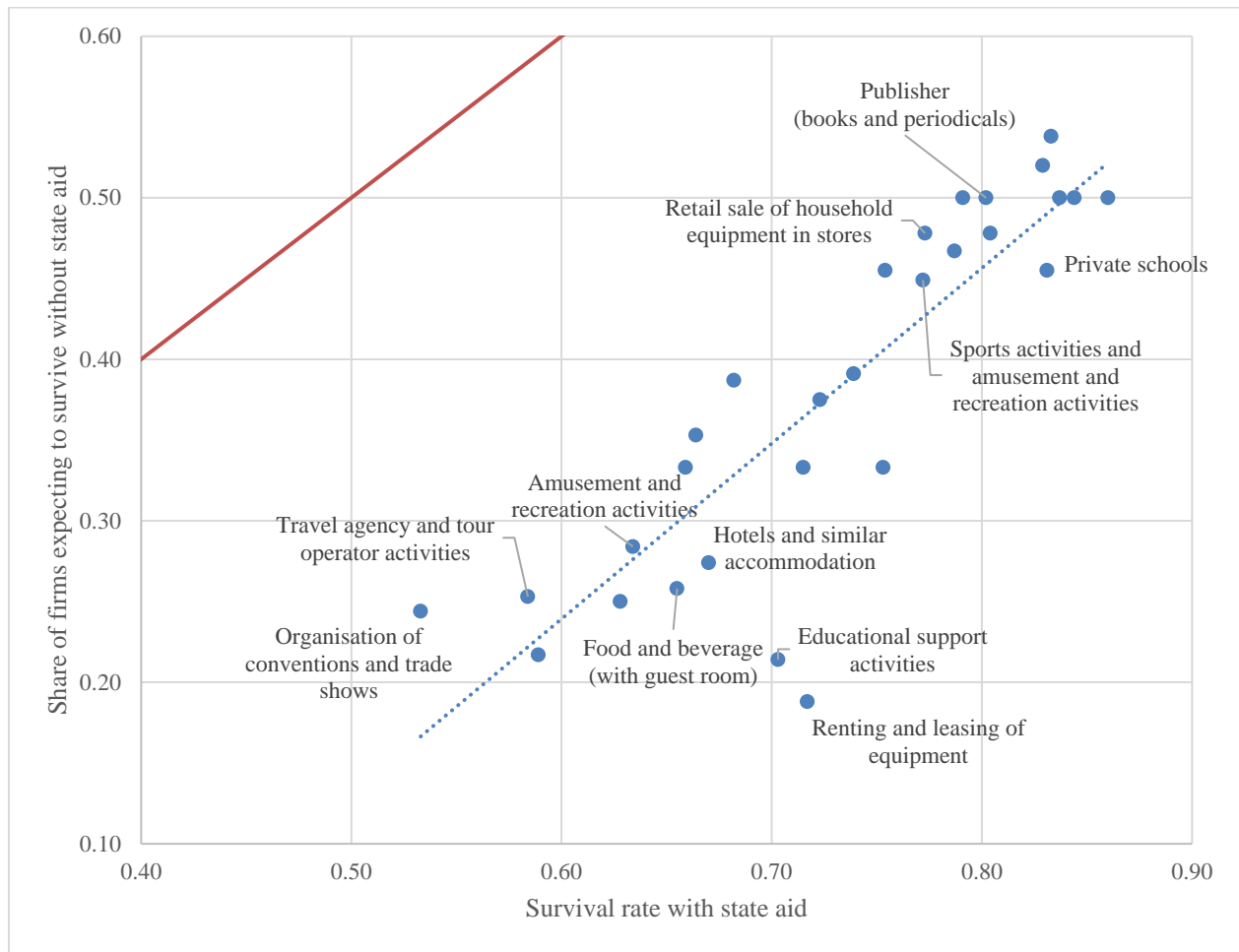**Figure 1: The Efficacy of Government Support by Industries**

Figure presents expected survival rates for 3-digit industries (on the x-axis) and the share of firms from this industry that expect to survive without state aid (on the y-axis). For industries where government support has not been effective, the solid 45-degree line would intersect with the industry's data point. The figure presents 29 industries with the lowest survival probabilities. The data is derived from the German Business Panel (GBP), wave 1 (July – October 2020). The sample includes 2,440 firm-level observations. The figure uses the following variables from the GBP: cgm20, cun9 (see the GBP Codebooks in Appendix C for more information).