

Jeremiah Nollenberger

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Living up to one's word?

Labor safeguarding in family firms during the Corona Crisis

Jeremiah Nollenberger¹

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Abstract: The economic literature has remarked on the stability of the German labor market, despite the severe impact of the pandemic induced recession. So, what factors contributed to this stability? The literature stresses the use of internal flexibility on firm level – reducing working hours and productivity - as key to understand safeguarding of employment. This use of internal flexibility was, in addition, strongly aided by state policies, such as short-time work. In complementarity to these arguments, the family business literature contends that family firms offer higher job security from economic shocks (*implicit labor contracts*). Family corporate governance is thus argued to lead to more extensive use of internal flexibility measures. To assess this argument, we analyze the German Bundesbank-Online-Panel-Firms survey (BOP-F). The data show that family firms did indeed offer higher job security. The propensity-score-matched regression estimates show family firms reacted around 50-60% less to changes in sales in terms of employment than their nonfamily firm counterparts. Looking at the use of financial instruments and government support programs, we find that family firms were more likely to use private financial instruments, such as retained earnings and private loans, whereas they were just as likely to receive government aid. Zooming out, these findings speak to family firms playing a pivotal role in preserving highly asset-specific labor market matches in times of crisis deemed essential for coordinated market economies. They do this by managing private capital differently, while not showing greater independence from the state as commonly conceived.

Keywords: family firms; implicit labor contracts; Corona Crisis; employment

JEL codes: D22, G32, J21, J50, M51

¹ Jeremiah Nollenberger, International Max Planck Research School on the Social and Political Constitution of the Economy (IMPRS-SPCE)/ University of Duisburg-Essen. Email: nol@mpifg.de. I would like to thank Jan Behringer, Till van Treeck, Svenja Flechtner and Zarah Westrich for helpful comments and advice on earlier drafts. Of course, all errors are mine.

Introduction

The German economy is characterized by producing highly specialized goods with incremental innovation cycles. This type of production requires a great deal of asset-specific knowledge that must be preserved over the business cycle. Varieties of Capitalism highlights multiple institutional complementarities that foster the build-up and preservation of asset specific human capital: Vocational training, codetermination, unemployment protections and a status maintaining welfare state give workers the security to invest their time acquiring non-portable asset-specific skills. Likewise, patient capital and collective bargaining improve firms' capabilities to preserve labor market matches (Hall and Soskice 2001; Estevez-Abe et al. 2001). Lastly, the state has stepped in with large short-time work subsidies during crises to secure employment relations (Herzog-Stein et al. 2022).

Family firms play an important role in German capitalism. For one, Germany's corporate structure is characterized by the disproportionate importance of predominantly family owned small and medium-sized enterprises (e.g., *hidden champions*) (Audretsch et al. 2018). For another, corporate ownership is heavily concentrated (Gourevitch and Shinn 2005, pp. 160–166) and families are prominent blockholders among listed firms. Aminadav and Papaioannou (2020) show that family ownership - understood as voting rights above the 20% threshold - is high at 26% of listed firms in Germany. Whereas it is significantly lower in Anglo-Saxon countries. The US and UK are estimated to lie at 16 and 10%, respectively. Strengthening this point, Achleitner et al. (2019), Gregoric et al. (2022) and Behringer et al. (2024) all highlight the importance of family ownership among German listed firms. For instance, Behringer et al. (2024) find 42% of their sample of non-financial publicly listed German firms to be family owned.

This paper sets out to analyze a so far under discussed complementarity, the role firm ownership – namely family ownership – plays in up keeping labor market matches during the downturn. Family business scholars have long argued that family firms have a special relation with their employees in the form of implicit contracting - paying less, but providing more secure jobs (Breda 2018). This implicit contracting is argued to be based on trust within the firm. We ask, in how far, family businesses aided in sustaining coordination by upholding trust in incomplete contracting during the Corona recession. This, in turn, leading to the preservation of asset-specific human capital. In this paper, we make three contributions: First, we synthesize arguments of family business scholars and macroeconomists to enhance our understanding of Germany's labor market resilience during the Corona recession. Second, we empirically test

the employment security hypothesis of family firms during a crisis period. This is when the implicit employment security is most likely to be pressure tested. We thus, to our knowledge, provide the strongest theory test for this part of the implicit family firm contract theory in the German context. Third, we are the first to look into the differential uptake of government aid programs from family firms to explain their crisis labor safeguarding.

The Corona Crisis severely impacted the German economy, leading to a massive drop in GDP in Q2 of 2020. GDP in this quarter fell more than 10% in contrast to its value in Q2 of 2019. After this initial recessionary shock, GDP growth remained negative throughout the entire year. Our analysis starts at the end of 2019 and ends in 2020, capturing the time window in which the German economy processed the initial Corona induced recessionary shock and its first lockdown. The first lockdown was instated 22. March and lasted until Mai/June of 2020, when restrictions were lifted step-by-step. By observing the entire year, we also marginally measure the responses to the second wave, as lockdown measures were reimplemented at the end of 2020. First restrictions were put in place in November (*lockdown light*) and the harsh second lockdown took effect as of 13. December 2020. As Graph 1 also shows, the unemployment rate displays a subdued response over the period, increasing slightly and ending up 0.6% points higher than it had been before the initial fall in GDP and decreasing again thereafter.

The analysis uses data from the Bundesbank-Online-Panel-Firms survey (BOP-F)² (Bodding and Köhler 2023) and is based on a cross-section of 495 firm observations. The propensity-score-matched regression estimates indicate that family firms did indeed offer higher job security as they are estimated to have reacted around 50-60% less to changes in sales in terms of employment than their nonfamily firm counterparts. A possible reason for this behavior, indicated by the data, is that family firms may have longer time horizons. Family firms' employment expectations were affected less by their exposure to the pandemic induced sales shock. Lastly, investigating how family firms could finance higher levels of labor hoarding, we find that family firms were more likely to use private financial instruments, such as retained earnings and private loans, whereas they were just as likely to receive government support measures.

² We are grateful for the Research and Data Service Centre of the Bundesbank providing us access to the data during a guest researcher stay (GaFo) as part of the project *Employment during the Corona Crisis* (2021\0042).

This paper is structured as follows: Section 2 reviews the relevant literature on Germany's labor market developments in recent crises. The section also discusses the literature on implicit contracts in family firms. Section 3 introduces the BOP-F data and lays out the econometric methods used in the analysis. In section 4, we present and discuss the empirical evidence for the questions, if family firms acted differently during the Corona Crisis in terms of employment and the follow up question of how they financed this behavior by looking at both the use of financial instruments and government support programs. Section 5 concludes.

2. Literature Review

The German labor market has remained remarkably stable in the recent crises. The performance during the Global Financial Crisis was dubbed a *German jobs miracle* (Krugman 2009) and also over the Corona Crisis experts remarked on its resilience (GCEE 2021, pp. 61–64). This resilience is due to firms making strong use of internal flexibility measures – i.e. reducing the hours per employee and productivity rather than decreasing employee numbers (Dietz et al. 2012; Herzog-Stein et al. 2018; Herzog-Stein et al. 2022). The literature for the Corona Crisis especially stresses the adjustment of working hours, which was aided by the government short-work subsidy, safeguarding employment over the crisis (GCEE 2021; Herzog-Stein et al. 2022). The effects of different working time policies have, in this vein, been widely discussed in the literature (see Boeri and Bruecker 2011, pp. 729–742; Bosch 2011, pp. 248–257; Burda and Hunt 2011, pp. 16–22; Kruppe and Scholz 2014; Balleer et al. 2016; Herzog-Stein et al. 2018, pp. 215–219; Aiyar and Dao 2021; Gehrke and Hochmuth 2021).

Theoretically, the use of internal flexibility is captured by the economic theory of cyclical labor hoarding, which describes firms keeping employment levels higher than (technically) necessary in the recession. This labor hoarding is primarily explained by rigidities resulting from fixed costs due to hiring, firing and training workers motivating firms to not adjust their labor demand to shocks (Biddle 2014; Stuart et al. 2021). Other reasons are relational, such as upholding informal rules and norms in the workplace (Dietz et al. 2012, p. 86). Thus, in a crisis, it may be operationally beneficial to keep employment up and stomach short-term losses to avoid the costs associated with changes in labor input. Family business scholars have long argued that family firms have a special relation to their workforces in form of implicit contracts. This literature argues that employment in family firms is more stable but, in return, pays less (Breda 2018). This means that family firms use internal flexibility to a larger extent. For instance, Bassanini et al. (2013) estimate dismissal rates to be 0.15 percentage points lower per quarter in French family firms, representing a 28% gap. Similarly, Sraer und Thesmar (2007, p. 731)

find that heir-managed family firms react significantly weaker in terms of employment to industry shocks than the rest of their sample of French stock listed firms, explaining the higher job security. This weaker reaction of family firms to economic shocks has later been corroborated by further studies (D'Aurizio and Romano 2013; Bjuggren 2015; van Essen et al. 2015; Ellul et al. 2018). Other studies, however, also find no effect for family firms on employee turnover (Lins et al. 2013; Neckebrouck et al. 2018; Casillas et al. 2019). For Germany, only Kölling (2020) has investigated implicit contracts in family firms, finding that family managed establishments indeed show less employment fluctuation during the years 2001 through 2015. However, the differential reaction to the Financial Crisis is not investigated in isolation. During the crisis, however, is when implicit contracting is most likely to be pressure tested.

Implicit contracting in family firms is explained from the perspective of an insurance logic. Workers have centralized their risk in their single employment relation, whereas the employers' risks are more diversified. Therefore, workers should be very interested in protection from business cycle shocks and the employer is, in theory, willing to provide employment security (in exchange for a premium). However, the theory highlights that there needs to be an ex-post mechanism to ensure that the employers keep up - or at least are perceived as keeping up - their end of the bargain. In incomplete contracting, it is merely a promise of job security – one the employer is likely to want to break when the employee's costs are larger than their marginal contribution to output (van Essen et al. 2013, p. 535; Guertzgen 2014, p. 347; Kim et al. 2018, p. 1252). Family business scholars thus argue the owning/managing family is a sufficiently trustworthy actor to make believable commitments to employment security, solving the coordination problem. The explanations build off the resource-based perspective, arguing that family firms are uniquely qualified to build social and reputational capital (Dyer, JR 2006, pp. 263–264). Two lines of reasoning can be differentiated: The first explanation is based on family firms following long-term goals; for example, because they have a multi-generational outlook. Therefore, family businesses should be less reactive to short-term fluctuations in, for example, sales (Kappes and Schmid 2013; Lehrer and Celo 2016). This argument is strengthened by stressing that family management is also in a position to take the long-term view, as their own tenure is longer, their position vis-à-vis family investors more secure and their outside management options limited (Sraer and Thesmar 2007, p. 729; Block 2010, p. 112; Bjuggren 2015, pp. 20–21; van Essen et al. 2015, p. 170). The second argument centers on reputational concerns, contending that family owners are easier to monitor than shareholders of widely held firms, enabling more direct reputational damage and sanctioning (Block 2010). Family management is argued to have typically worked for many years in the firm before taking

over leadership responsibilities. Therefore, they have built-up trusting relationships with workers and are less anonymous with commitments staying in the family (Bjuggren 2015, p. 3; Bach and Serrano-Velarde 2015, pp. 3–4; Neckebrouck et al. 2018, pp. 6–7). Owing families are also claimed to be embedded in local communities, in which they draw socio-emotional value from their reputation and cultivate good neighborly relationships. This makes family businesses more concerned about the negative consequences of performing lay-offs (D'Aurizio and Romano 2013; Kim et al. 2020).

As the use of internal flexibility - especially based on productivity – is a costly strategy in the short run, the follow up question arises of how family firms are able to financially uphold their commitments. To our knowledge, this has only been investigated in multi-country settings for listed firms. Lins et al. (2013, p. 2595) find that while family controlled firms did not deviate in terms of their cash holding, dividend payouts, leverage, debt or equities, they did reduce their investments (measured as capital expenditures to assets) more than widely held firms during the Global Financial Crisis. Ellul et al. (2018, pp. 1330–1331) find that earnings, dividends and cash holdings were more sensitive to shocks in family vis-à-vis non family firms, however, the estimated difference is minor (about 5%). They find that the sensitivity is highest for cash holdings and the weakest for earnings. This minor difference in the sensitivities is furthermore estimated to decrease with rising unemployment insurance in the country. Thus, the estimates may not travel to the German case.

3. Data and Methods

3.1 Data

In order to investigate the role family firms played in stabilizing employment during the Corona Crisis and what financial instruments or government aid programs they used to achieve this, we analyze BOP-F. BOP-F is a representative online survey at firm level conducted by the Research Data and Service Center of the German Bundesbank in cooperation with the survey company forsa. The survey includes firms of all sectors, regions and size classes. More specifically, the survey's population are German firms with taxable sales above €22.000 or at least one employer who is subject to social security contributions. Based on industry, region and size, proportional random samples are drawn from this population. The survey was launched in June 2020 and follows a rolling survey procedure. The contents of the survey include questions on firm characteristics, their economic situation, expectations as well as

questions regarding current topics. In the first waves, these current topics centered around the impact and changes resulting from the pandemic induced crisis (Boddin et al. 2022).

As employment is captured numerically starting in survey wave 5 (in the field April-May 2021) and only this wave includes employment (December 2019) and sales (annual sales of 2019) prior to the crisis, our analysis centers around this wave. We add in additional information on the use of government support programs from waves 4 (field January-February 2021) and 8 (field January-March 2022). Joining this data provides us with a cross-section of just shy of 500 firms for which all the variables of interest are available. This cross-section consists in its majority of micro and small firms which make up around 70% of the sample. Our median firm had 23 employees at the end of 2019 and €3 million in 2019 annual sales. This means that medium and especially large firms are nonetheless overrepresented in our sample, as micro and small firms made up around 82 and 15% respectively of all firms in the German economy in 2019 (Destatis 2024). Our sample is skewed towards larger firms for two reasons: First, we drop firms reporting no employees and second, the initial waves of the survey disproportionately included large firms (Boddin et al. 2022, p. 7).

We measure family firms via a survey question to self-identify the firm type. Family firm is one of the response items. This strategy most closely captures the firm properties highlighted by the essence-based definition of family firms (see Chua et al. 1999) and is sensible, given our data. Almost 70% of our firm sample consists of micro and small firms, whose ownership and management structures are likely very similar with strongly concentrated ownership and a single manager. These are the components of involvement most commonly used to identify family firms (Diaz-Moriana et al. 2019). With this self-identification strategy, we rather aim to measure aspects of family business culture, such as following visions and values through the business that are upheld by the family sphere and possible transgenerational intent. These aspects – as discussed above – are argued to make family firms' labor relations unique.

Remarkably, we see no large differences in firm sizes across the family and nonfamily firm subsamples. As the closest point of contrast, we compare our sample with Klein (2000) who surveyed a representative set of German firms in the late 1990s identifying family firms via their components of involvement. This comparison highlights two features: First, family firms make up 41% of our sample, which is comparatively low, even in comparison to more restrictive family firm definitions. Based on more restrictive definitions, family firms still make up 49% in Klein's data. Second, we find a more or less uniform distribution of family firms across size classes, whereas Klein (2000, pp. 159–160) finds the percentage of family firms to

decrease with firm size. This high proportion of firms that identify as family firms among the larger firms in our sample is surprising, however, it echoes the cited literature pointing to family firms' high prevalence among large listed firms (Behringer et al. 2024). The second surprising feature is the low percentage of micro and small firms which self-identify as family firms, in contrast to estimates based on the components of involvement. One possible intuition may be that especially smaller firms perceive the family involvement to be less of a point of identification as it is more common among firms of their size and thus report self-identification less often. Regardless, the data show that self-identification and components of involvement-based measurements substantially differ in their classification of family firms across firm sizes. Finally, we caution that we contrast observations that lie more than 20 years apart, therefore a part of the differences described are due to temporal factors.

The summary statistics also show that in the family and nonfamily firm subsamples, sales are reported to have decreased by 10 and 12%, respectively, with large deviations from these means. Employment decreased by around 3% in both subsamples with nonfamily firms, notably, reporting a higher deviation from this mean. This means that sales and employment clearly show more negative developments in our sample than in the macroeconomic numbers cited in the introduction. The primary explanation for this is that our unit of analysis is the individual firm and its behavior. We thus do not weigh the firms in accordance with their contribution to the overall change in employment or sales in our sample. As Graph 2 shows, employment and sales growth were on average more negative the smaller the firm. Smaller firms, however, have a lessened individual impact on the macroeconomic outcome, while making up the majority of our sample. The only deviation from the pattern the smaller the firm the more negative the growth rate, is employment in medium-sized firms, which is positive, despite the negative mean sales shock. One plausible explanation here for may be the firm lifecycle, with many firms in this medium-sized category being in their growth phase, whereas of the large firms a higher percentage is in their mature stage (Mueller 1972).

As far as economic sectors are concerned, the biggest three sector clusters are the service sectors (30%), the manufacturing industry (26 %) and the construction industry (11%). Moving on to the sources of financing and receipt of government aid, we measure these variables as binaries, indicating if they were used or not. We therefore cannot differentiate between the extent of their use, which could, in principle, differ between firm types. In the summary statistics, we see that the use of retained profits and bank credit are the most widely spread sources of financing for both family and nonfamily firms. As for the different sources of government support during the

crisis, we can see that short-time work was clearly the most widely adopted instrument, with almost half of the firms implementing the policy. The full summary statistics tables can be found in the appendix (Tables A1 and A2).

3.2 Estimation Strategy

In order to estimate the difference in the employment reactions to the crisis induced sales shock between family and nonfamily firms, we specify our baseline regression model as follows:

$$(1) \Delta Employ_i = \beta_1 Fam_i + \beta_2 Shock_i + \beta_3 Fam_i * Shock_i + \beta_4 X_i + \varepsilon_i$$

$\Delta Employ_i$ measures the change in the number of employees between December 2019 and December 2020 in log percent points. Fam_i is a dummy, indicating 1 for a family firm. The dummy is constructed via the survey question to self-identify the firm type, as discussed above. $Shock_i$ is the change in sales between December 2019 and December 2020, measured in log percent points. $Fam_i * Shock_i$ is the interaction term between both variables and captures the systematic difference between the firm types in their reaction to recession induced sales shocks in terms of employment.

X_i is a vector of further firm specific control variables. In our baseline specification, we control for the firm's sector. We exclude financial and insurance activities, interest representation, and the public sector, as they do not follow the typical business cycle. Further, we control for firm size using size dummies based on 2019 sales and employment values following Destatis' categorization. Further regionals controls capture where the firm's headquarter is located. In a second regression, we add in the change the firm expects to see in its sales in late 2022, in contrast with late 2019 (in %), to capture the business outlook. Further, we include the change in average production costs from 2019 to 2020, to account for differential effects from costs, for example, brought by supply chain issues, as an additional control variable.

3.3 Endogeneity and unobserved heterogeneity

Overall, the concern of endogeneity is mitigated by our research design that follows the natural experiment framework: The corona virus induced recession can reasonably be interpreted as exogenous and unpredictable to the individual firm and it is thus not plausible for firms to have adjusted their employment in anticipation to the unforeseen shock. Nonetheless, one central addressable endogeneity concern remains with simply measuring the firm's specific exposure to the crisis by its change in sales. The intuition is that one part of the sales development may have been expected due to sectoral or regional trends, etc., while only the other part is truly

exogenous and originating from the unforeseen virus induced recession. Guiso et al. (2005) developed an econometric technique to isolate this unexpected exogenous part in the sales shock that has since been widely used in the literature (see Guertzgen 2014; Bjuggren 2015; Kim et al. 2018; Ellul et al. 2018). Here, sectoral, temporal and other expected developments are regressed out of the sales development in the first step and in the second step, the residuals from this first stage regression are used as the (idiosyncratic) shock term in the baseline regression model (1). The idiosyncratic shock term is estimated as follows:

$$(2) [\log(\text{sales}_{i,2020}) - \log(\overline{\text{sales}_{2020}})] \\ = \beta_1 [\log(\text{sales}_{i,2019}) - \log(\overline{\text{sales}_{2019}})] + \beta_2 \text{sector}_i + \beta_3 \text{state}_i + \varepsilon_i$$

The dependent variable is the demeaned sales for 2020 in logs. The independent variables are the demeaned sales for 2019 in logs and dummies for the sector and the federal state in which the firm's headquarter is located in. The sales terms are demeaned in order to exclude the general sales trend, as is done for the fixed effects transformation in panel data³. Nonetheless, this design cannot fully rule out the influence of endogeneity, as the number of employees may also have an effect on sales. Thus, an (in)voluntary increase/reduction in employees may also influence the size of the sales shock. As our data is cross-sectional, we cannot assess that the sales shock indeed predates the employment reaction. Therefore, we interpret our findings rather as associations than strictly causal.

To minimize the influence of unobserved heterogeneity between the family and nonfamily firm groups, we weight our estimates using propensity score matching. Propensity score matching is a method used to achieve a better balance between the control and treatment groups when treatment is not assigned at random. The intuition is to calculate how likely the observed firm is to be part of the treatment group (family firms), given its other (observed) characteristics and then comparing firms with a similar probability of treatment (Stuart 2010). This weighting is a common procedure in the literature (see Lins et al. 2013; Ellul et al. 2018; Neckebrouck et al. 2018; Kölling 2020). We use pre-crisis characteristics – (log) turnover, (log) employment, region and sector groups – to estimate matching weights using the subclassification algorithm, as this matching algorithm performs best with our data. The love plot (Graph A3) shows that

³ One limitation is, however, that our cross-sectional data does not allow for GMM estimation, as is the standard procedure. Therefore, the OLS estimates may be biased by the lagged sales term, which is endogenous by construction.

the overall standardized mean difference between the groups is drastically reduced by the matching procedure. The overall mean square difference in the unweighted data shows that there are clear differences between the groups at around 0.5. After propensity score matching, the overall mean square error differences fall drastically below the 10%-threshold marked by the dashed lines. The values for all the covariates individually also fall below the 10%-threshold after matching, indicating a good balance between the groups.

The regression models are estimated by OLS using heteroskedasticity robust standard errors. In all models including the idiosyncratic shock term, we calculate the standard errors on the basis of 1000 bootstrap replication instead, as this is a generated regressor produced in a first stage regression (Ellul et al. 2018, p. 1311). Lastly, all metric variables are winsorized at the 1st and 99th percentiles.

4. Results

4.1 Descriptive statistics

Before moving on to the regression analysis, we first aim to provide some descriptive insight into our findings. Graph 3 shows the change in employment on the y-axis and the sales shock on the x-axis. The graph is separated into the nonfamily firm group on the left and the family firm group on the right. The hexes group the observations in the graph and show the number of observations grouped by color coding. For both family and nonfamily firms, the largest group hex is centered around the intersection of the x and the y-axes, indicating no large changes in either dimension. The graph also shows employment and sales to be associated positively with hexes primarily located either in the positive or negative fields on both dimensions. The visual inspection thus does not provide evidence against the assumed linear relationship between the two variables. Fitting to our expectations, the family firm plot is more condensed. The nonfamily plot, in contrast, shows more negative (and positive) variation in the employment dimension. Family firms are thus shown to buffer employment, when exposed to a large negative sales shock as well as hiring less when profiting from the crisis.⁴ Overall, this bivariate depiction strengthens the argument that family firms react less strongly to sales shocks.

⁴ One concern may be, given the large negative exposure and the larger retention of labor, this may lead to more closures of family firms. This concern is, at least for other countries, addressed without finding confirming evidence. See Wilson et al. 2013 and Casillas et al. 2019.

4.2 Did family firms hoard more labor during the Corona Crisis?

Moving on to the multivariate analysis, we report our baseline regression estimates in Table 1. In the first model, we estimate our baseline model via OLS and then add in additional control variables in model 2. Models 3 and 4 repeat this procedure using the idiosyncratic sales shock instead of the change in sales on the level of the firm. The substantive results remain unchanged across all models. As expected, we find a positive and highly significant relationship between sales and employment developments (pass-through coefficient). Our estimates indicate that a 10% drop (rise) in sales is associated with a decrease (increase) in employment between 1.7 and 2.5%. The coefficients of the interaction term between the family dummy and the change in sales are negative and roughly 50–60% of the size of the respective pass-through coefficient. The interaction terms reach the 10%-threshold of statistical significance for the baseline sales shock term and the 5%-threshold for the idiosyncratic sales shock term. Family firms are thus estimated to absorb more than half of the pass-through from short-term sales to employment, in accordance with the implicit family firm contract hypothesis.

A retort to these findings may be that the differences are driven by firm sizes, arguing that firm size and family business status are strongly linked. While our summary statistics do not indicate this strong link between firm size and family businesses and we control for firm size by including it in both the propensity score matching and as a covariate in the estimated model, we rerun the model to include the interaction between employee count in 2019, as a size proxy, and the sales shocks to rule out possible non-linearities. Table A4 shows that when blocking this channel, our results do not change meaningfully⁵.

4.3 Does crisis labor hoarding have a medium-term effect?

In sum, the results above strengthen the case for family firms reacting less strongly to sales shocks also in the German case. Thus, in a setting of overwhelmingly negative sales shocks, hoarding more labor than their nonfamily firm counterparts. To assess if this difference in responses also persists in the mid-term outlook, we introduce the expected change in employment at the end of 2022, in contrast with late 2019 (in %), as our new dependent variable and rerun our regression models. We report the results in Table 2: The sales shock from the pandemic is still positively associated with the employment outlook in models 1 and 3. This hints at the pandemic induced sales shock affecting the employment levels for the years to

⁵ In model 1 the interaction term falls just below the 10%-threshold of statistical significance. All other coefficients remain in sign and size. Disclosure requirements do not allow us to use the size dummies in this regression. Therefore, instead, we use the number of employees in 2019 to proxy size. We also used the 2019 sales in the interaction term and find nearly identical results.

come. Plausibly, the size of the coefficient is noticeably smaller with a 10% drop (rise) in sales during the pandemic being associated with a decrease (increase) in the employment outlook of less than 1.5%. The interaction term between the sales shock and the family business dummy remains negative, however, statistically significantly so only for the firm level sales shock in model 1. Thus, signaling that the differences in labor hoarding between family and nonfamily businesses shown in their immediate crisis reactions also has an impact on their planning for exiting the recession. Furthermore, this weaker connection between the immediate sales shock and the employment outlook is weak evidence in favor of family firms having longer planning horizons and this being a channel to explain why family firms react less strongly to the short-term sales shocks in terms of employment (Sraer and Thesmar 2007, p. 729; Block 2010, p. 112; Kappes and Schmid 2013; Bjuggren 2015, pp. 20–21; van Essen et al. 2015, p. 170; Lehrer and Celso 2016).

When adding in the sales outlook for 2022, all other terms in the models become insignificant - but the discussed coefficients keep their signs. The estimation results speak for a strong and significant positive correlation between the expected sales and employment developments until 2022. This likely has two reasons: First, the expected sales and the expected employment are likely truly strongly linked. However, second, the two items were also collected as subsequent questions in the survey. So, the connection is likely strengthened due to a priming effect brought by the survey design and, therefore, overestimated. One indication for this is that the R^2 more than doubles when the sales expectations are included in the model. These results thus need to be interpreted with appropriate caution.

4.4 How do family firms finance labor hoarding?

The weaker reactions in terms of employment to sales shocks in family firms shown above, leads to the follow up question of how family firms secure their – in the short-term - costly implicit commitments to their employees. To give us an intuition, we look at the financial instruments as well as government support programs the firms report using during the pandemic and insert these as our new dependent variables. Specifically, we look at the use of (1) retained earnings, (2) bank loans, (3) other private loans⁶, (4) government sponsored loans, (5) loans by the *Kreditanstalt für Wiederaufbau (KfW)*, (6) use of short-time work and (7) receiving emergency aid by the government⁷. As all of these variables are measured as binaries, we run

⁶ Overdraft and/or trade credit.

⁷ either *Soforthilfe* (03/2020 – 05/2020) or *Überbrückungshilfen I to IV* (launched in June 06/2020)

logistical regressions to fit their functional form and use the full set of control variables from the previous regressions.

The results presented in Table 3, in sum, show the clear picture of family firms engaging differently with private capital, whereas they do not differ in their use of government support from their nonfamily firm counterparts. Specifically, the regressions show family firms being more likely to have drawn from retained earnings and to have used private loans (bank loans, trade- and/or overdraft credit) during the crisis. All three coefficients are positive and significant at the 5 or 1%-level. Whereas, moving on to the support mechanisms of the state (regressions 4-7), there are no differences across firm types in the probability of use for any of these measures at conventional levels of statistical significance. These results broadly support the findings of Ellul et al. (2018) and Lins et al. (2013) who also find family firms have differing financial reactions to a crisis than nonfamily firms. For instance, Ellul et al. (2018) find family firms adjust their cash holdings more strongly to crisis exposure, fitting our finding of the higher likelihood of family firms to use retained earnings for financing crisis costs. While these findings stand in contrast to Lins et al. (2013) who find no difference in either cash holdings or debt by firm type. However, the results are difficult to compare across the studies as the average firm in our sample is much smaller than in the reference literature and firm size is shown to have a significant effect on the use of these financial instruments. Further, we measure the use as binary and not the extent of the use. As for the use of government support measures in family firms during an economic crisis, we are, to our knowledge, the first to empirically investigate this channel of financing.

Discussing these findings in the context of the broader German economy, (listed) family firms in Germany have been shown to retain a larger share of their earnings (Behringer et al. 2024). While these corporate savings have been critiqued for contributing to Germany's unstable reliance on export demand and increasing economic inequality (Behringer and van Treeck 2018, 2023), these savings may have a silver lining in stabilizing employment in the downturn as argued by Boysen-Hogrefe and Groll (2010, p. 45). Moreover, these retained earnings in combination with better communal ties established via socio-economic embeddedness may enable family firms to have better access to private credit lines to keep business going when sales plummet as Crespí-Cladera and Martín-Oliver (2015) and D'Aurizio et al. (2015) find for Spain and Italy respectively during the Financial Crisis.⁸

⁸ Ellul et al. 2018; Lins et al. 2013 and Bryson et al. 2016, however, find contradictory evidence on access to credit for family firms.

Our findings on the use of government support question the prevailing narrative of family firms' strong self-reliance and independence from the state. We rather find evidence against a more arm's length relation. At second glance, however, this result does not appear too surprising as the support measures were politically designed to be enacted as quickly and unbureaucratically as possible. Thus, the support measures came with very limited strings attached and, importantly, did not impede on families' control over their firms. The emergency aid programs were set up for small firms to provide liquidity during the months in which the lockdown or recession induced large decreases in sales. The money was paid out as grants covering a fixed percentage of operating cost, dependent on expected loss in sales. These grants did not have to be repaid and if the sales loss was smaller than expected, the excess grant was collected back in the subsequent tax return. Exemplary of the limited government oversights over these grant's initial dispersion is that the *Soforthilfen* were prone to a significant amount of fraudulent claims (Barthel 2023; Handel 2023). These aid programs therefore had virtually no downsides for eligible firms. KfW-Credit programs were also designed to be attractive to firms and the loaning bank alike. These programs guaranteed low interest rates based on the rates on the capital markets, generous repayment periods and transferred the credit risk to the state by it making high liability guarantees (80-90% *Unternehmerkredit*, 100% *Schnellkredit*) (Schulze-Spüntrup and Wagner 2021). Only very minor strings came attached in form of some limitations to the firm's dividend and withdrawal policies until fully repaid (KfW 2022a, p. 2, 2022b, p. 2). Lastly, short-time work was also designed to be very supportive of firms: The estimated work stoppage threshold was lowered from 30 to 10% for short-time work eligibility, working time accounts were no longer required to be negative and non-wage labor costs were fully covered (Bundesregierung 2020). These non-wage labor costs are estimated to have cost firms around 24-35% of the typical labor costs when under short-time work during the Financial Crisis (Bach and Spitznagel 2009). Short-time work also allowed a great deal of flexibility in its implementation. The amount of short-time work could vary across departments and workers could also have their hours reduced partially. This program, too, came with only very limited downsides, such as topping up short-time workers' pay⁹ and requiring workers' consent to short-time work implementation. In the bigger picture, Hancké et al. (2022) argue Germany could build on a number of institutional complementarities that allowed government support to be disbursed uninstruively and flexibly. Namely, labor representation allowed for the monitoring of working times and thus the flexible reduction of working hours in contrast to the

⁹ In late April 2020, the government increased the payment for workers receiving short-time work for multiple months and thereby further limited top up costs for firms.

all-or-nothing approach initially implemented in the UK. Moreover, the cooperation of the KfW and *Hausbanken* solved many information asymmetries, as *Hausbanken* were familiar with the firm's business histories, leading to wider and easier access to credit with very high loan approval rates.

5.0 Conclusion

In this paper, we investigated German family firms' role in safeguarding employment during the Corona recession. The safeguarding of employment is vital to preserve asset-specific human capital in the German model of capitalism. Based on our propensity score matched estimation, we find German family firms played a pivotal role herein and contributed to the German labor markets resilience by securing strategic coordination in times of crisis. Family firms reacted over 50% less to changes in their sales in terms of employment than their nonfamily firm counterparts. This finding is robust to an idiosyncratic reformulation of the sales shock and we show that it is likely to persist in family firms' medium-term employment outlooks. We thus strengthen the case for implicit contracts in German family firms with results that are broadly in line with the findings for other time periods and country contexts.

Following up on how family firms finance this hoarding of labor, which is a costly strategy in the short term, our findings point to differences in the use of private resources rather than the use of governmental crisis aid. We show that family firms are more likely to have used retained earnings, bank as well as other private credit lines than their nonfamily firm counterparts in the immediate response to the pandemic induced recession. In contrast, we find no difference in the likelihoods of using government aid - most importantly short-time work - to enable hoarding labor at higher levels in family firms. These results speak against family firms being more independent of the state, as is commonly conceived. However, this may be explained by support measures coming with virtually no downsides, especially without strings attached, impeding families' control over the firm.

Limitations in the scope of this paper present potential avenues for further research. While we were able to zoom in and identify differences between family and nonfamily firms in their immediate reactions to the pandemic, the chosen time window is rather short from 2019 to 2020. Thus, it would be of interest if these differences do indeed persist, as indicated by the expectations of firms. Further, location has been highlighted as a fruitful avenue for family business research, showing that family firms in rural areas are less likely to perform lay-offs because of both socio-emotional embeddedness (Amato et al. 2020; Kim et al. 2020) as well as a limited local supply of labor. Data limitations do not allow us to go into depth beyond the

regional level, but extending this research to the German case would be valuable for understanding the channels through which family firms hoard labor. Lastly, we only investigated one side of the implicit contracting in family firms hypothesis, excluding wage level differences from our analysis.

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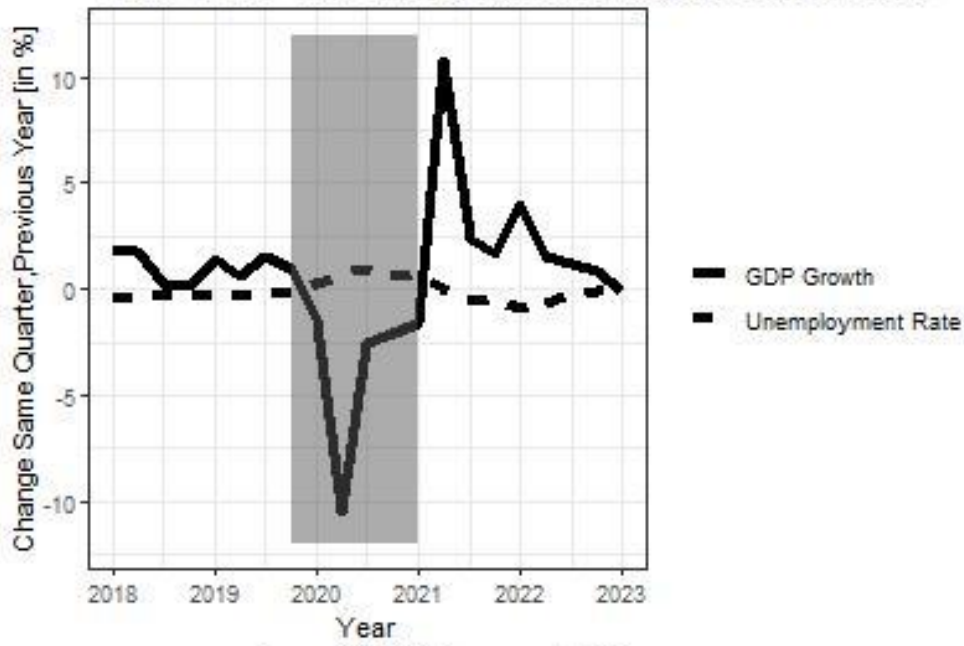
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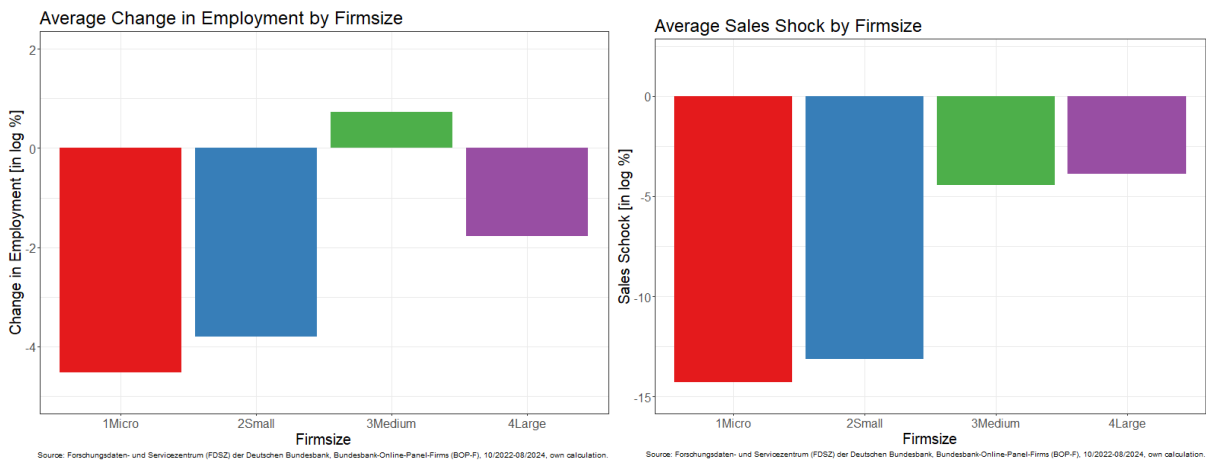
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Graph 1: GDP and Unemployment during the Corona Crisis



Source: OECD.Data, own calculation.

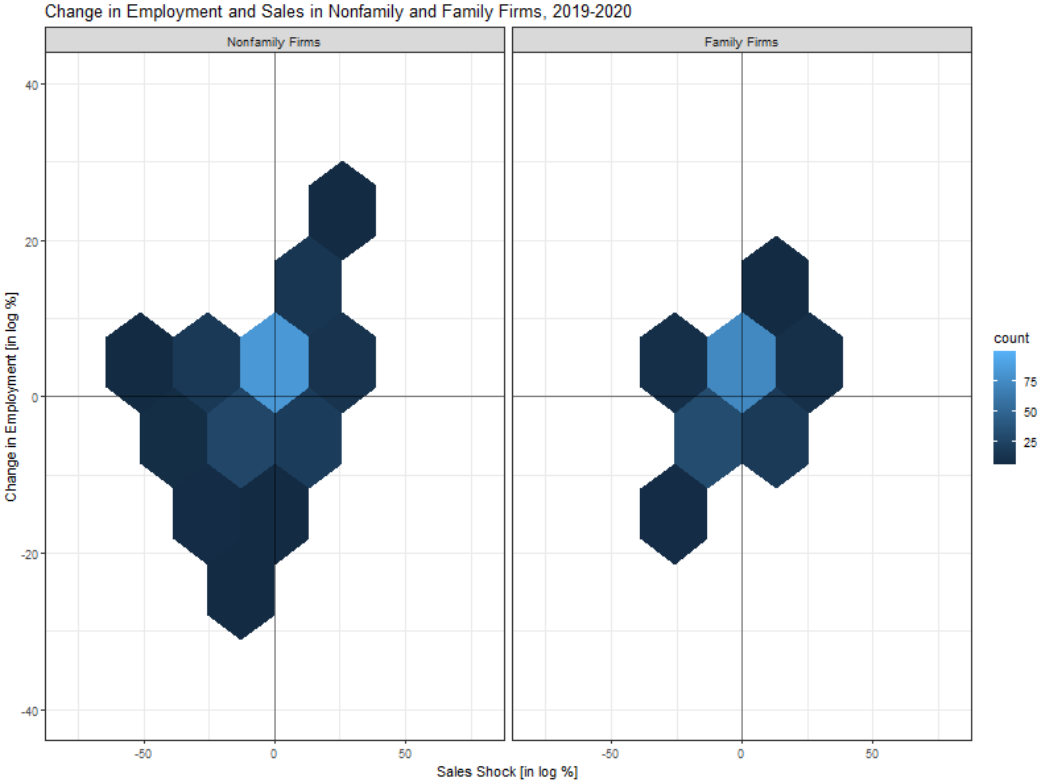
Graph 2: Sales Shock and Unemployment by Firmsize



Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F), 10/2022-08/2024, own calculation.

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F), 10/2022-08/2024, own calculation.

Graph 3: Change in Employment and Sales in Nonfamily and Family Firms, 2019-2020



Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F), 10/2022-08/2024, own calculation.

Table 1

Employment Reactions to Sales Shocks in Family and Nonfamily Firms, 2019-2020

	Dependent variable:			
	(1)	(2)	(3)	(4)
	Change in Employment [in log %]			
Family Firm	-1.545 (1.698)	-0.869 (1.672)	-0.388 (1.697)	0.303 (1.695)
Sales Shock	0.242*** (0.048)	0.206*** (0.046)		
Idiosyncratic Sales Shock			0.215*** (0.053)	0.173*** (0.050)
Small Firm	0.541 (2.582)	-0.329 (2.547)	0.200 (2.694)	-0.679 (2.647)
Medium Firm	3.985* (2.126)	2.649 (2.088)	4.038* (2.205)	2.693 (2.167)
Large Firm	1.400 (2.187)	0.199 (2.220)	1.720 (2.306)	0.387 (2.361)
Sales Expectations for 2022		0.158** (0.071)		0.198*** (0.075)
Change in Production Costs		-0.216 (0.200)		-0.224 (0.214)
Family Firm * Sales Shock	-0.111* (0.066)	-0.107* (0.061)		
Family Firm * Idiosyncratic Sales Shock			-0.136** (0.063)	-0.125** (0.059)
Constant	1.239 (3.681)	2.093 (3.920)	0.967 (3.909)	1.830 (4.068)
Sectoral Controls	Yes	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes	Yes
Observations	495	481	495	481
R2	0.191	0.219	0.163	0.201
Adjusted R2	0.168	0.192	0.139	0.174
Residual Std. Error	19.708 (df = 480)	19.682 (df = 464)	20.047 (df = 480)	19.901 (df = 464)
F Statistic	8.108*** (df = 14; 480)	8.127*** (df = 16; 464)	6.688*** (df = 14; 480)	7.317*** (df = 16; 464)

Note:

*p<0.1; **p<0.05; ***p<0.01

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F),10/2022-08/2024, own calculation.

Table 2

Employment Outlook after Sales Shocks in Family and Nonfamily Firms, 2019-2022

	Dependent variable:			
	(1)	Expected Change in Employment for 2022 [in %]		(4)
		(2)	(3)	
Family Firm	-0.580 (1.114)	0.367 (1.018)	0.164 (1.143)	0.867 (1.695)
Sales Shock	0.142*** (0.032)	0.038 (0.029)		
Idiosyncratic Sales Shock			0.118*** (0.035)	0.029 (0.050)
Small Firm	1.158 (1.644)	0.032 (1.388)	0.973 (1.748)	0.001 (2.647)
Medium Firm	1.831 (1.516)	0.282 (1.234)	1.777 (1.551)	0.301 (2.167)
Large Firm	-0.133 (1.613)	-1.601 (1.380)	0.009 (1.651)	-1.559 (2.361)
Sales Expectations for 2022		0.372*** (0.052)		0.379*** (0.075)
Change in Production Costs		-0.063 (0.105)		-0.058 (0.214)
Family Firm * Sales Shock	-0.072* (0.042)	-0.047 (0.038)		
Family Firm * Idiosyncratic Sales Shock			-0.061 (0.052)	-0.038 (0.059)
Constant	1.741 (1.891)	2.038 (1.923)	1.689 (2.081)	1.880 (4.068)
Sectoral Controls	Yes	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes	Yes
Observations	494	481	494	481
R2	0.142	0.396	0.116	0.394
Adjusted R2	0.117	0.376	0.091	0.373
Residual Std. Error	13.409 (df = 479)	11.422 (df = 464)	13.611 (df = 479)	11.442 (df = 464)
F Statistic	5.683*** (df = 14; 479)	19.048*** (df = 16; 464)	4.506*** (df = 14; 479)	18.882*** (df = 16; 464)

Note:

*p<0.1; **p<0.05; ***p<0.01

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F),10/2022-004/2024, own calculation.

Table 3

Sources of Financing and Use of Government Programs in Family and Nonfamily Firms, 2019-2020

	Dependent variable:						
	Retained Profits logistic (1)	Bank Loan logistic (2)	Other Private Loan logistic (3)	Government Sponsored Loan logistic (4)	KFW Loan logistic (5)	Short-time Work logistic (6)	Emergency Aid logistic (7)
Family Firm	0.557** (0.224)	0.724*** (0.220)	0.563*** (0.214)	0.311 (0.228)	0.092 (0.346)	0.167 (0.226)	-0.166 (0.284)
Sales Shock	-0.0001 (0.002)	-0.0004 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.005 (0.003)	-0.022*** (0.005)	-0.011* (0.006)
Small Firm	0.279 (0.272)	0.912*** (0.270)	0.035 (0.266)	0.931*** (0.301)	0.756* (0.420)	0.961*** (0.295)	-0.823** (0.345)
Medium Firm	0.861*** (0.303)	0.891*** (0.286)	0.308 (0.280)	0.741** (0.315)	0.523 (0.459)	1.212*** (0.295)	-2.754*** (0.559)
Large Firm	0.870** (0.408)	1.270*** (0.370)	0.419 (0.356)	0.811** (0.377)	-0.008 (0.635)	0.988** (0.384)	-2.675*** (0.755)
Sales Expectations for 2022	0.004 (0.005)	-0.002 (0.005)	0.001 (0.005)	0.007 (0.005)	0.003 (0.008)	0.003 (0.006)	-0.023*** (0.009)
Change in Production Costs	-0.025 (0.017)	-0.013 (0.016)	-0.011 (0.015)	0.009 (0.018)	-0.046* (0.024)	-0.004 (0.016)	0.022 (0.021)
Constant	-0.100 (0.518)	-0.115 (0.482)	-0.288 (0.469)	-1.555*** (0.560)	-17.682*** (0.418)	-1.806*** (0.677)	0.152 (0.662)
Sectoral Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	479	481	481	479	465	481	446
Log Likelihood	-314.295	-309.629	-332.910	-268.767	-155.478	-277.636	-200.691
Akaike Inf. Crit.	660.591	651.259	697.820	569.534	342.956	587.272	433.382

Note:

*p<0.1; **p<0.05; ***p<0.01

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F),10/2022-08/2024, own calculation.

Appendix

Table A1: Summary Statistics Family Firms

Variable	N	Mean	Std.Dev	Median
Change in Employment 2019-2020 [in log %]	205	-3.2	17	0
Expected Change in Employment for 2022 [in %]	204	-0.34	13	0
Sales Shock	205	-10	44	-1.2
Idiosyncratic Sales Shock	205	0.55	52	5.7
Firmsize	205			
... 1Micro	88	43%		
... 2Small	49	24%		
... 3Medium	42	20%		
... 4Large	26	13%		
Sales Expectations for 2022 [in %]	203	0.44	21	0
Change in Production Costs [in %]	198	3.5	6.8	1
Use of Retained Profits	205			
... 0	61	30%		
... 1	144	70%		
Use of Bank Loan	205			
... 0	80	39%		
... 1	125	61%		
Use of Other Private Loan	205			
... 0	94	46%		
... 1	111	54%		
Use of Government Sponsored Loan	204			
... 0	133	65%		
... 1	71	35%		
Use of KFW Loan	199			
... 0	174	87%		
... 1	25	13%		
Use of Short-time Work	205			
... 0	96	47%		
... 1	109	53%		
Use of Emergency Aid	191			
... 0	143	75%		
... 1	48	25%		

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F), 10/2022-04/2024, own calculation.

Table A2: Summary Statistics Nonfamily Firms

Variable	N	Mean	Std.Dev	Median
Change in Employment 2019-2020 [in log %]	290	-3	24	0
Expected Change in Employment for 2022 [in %]	290	-0.26	16	0
Sales Schock	290	-12	45	-2.8
Idiosyncratic Sales Shock	290	-1.4	48	3.8
Firmsize	290			
... 1Micro	157	54%		
... 2Small	51	18%		
... 3Medium	54	19%		
... 4Large	28	10%		
Sales Expectations for 2022 [in %]	288	1	25	0
Change in Production Costs [in %]	284	1.8	6.2	0
Use of Retained Profits	288			
... 0	121	42%		
... 1	167	58%		
Use of Bank Loan	290			
... 0	172	59%		
... 1	118	41%		
Use of Other Private Loan	290			
... 0	176	61%		
... 1	114	39%		
Use of Government Sponsored Loan	289			
... 0	222	77%		
... 1	67	23%		
Use of KFW Loan	278			
... 0	251	90%		
... 1	27	10%		
Use of Short-time Work	290			
... 0	171	59%		
... 1	119	41%		
Use of Emergency Aid	265			
... 0	195	74%		
... 1	70	26%		

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F), 10/2022-04/2024, own calculation.

Graph A3: Love Plot

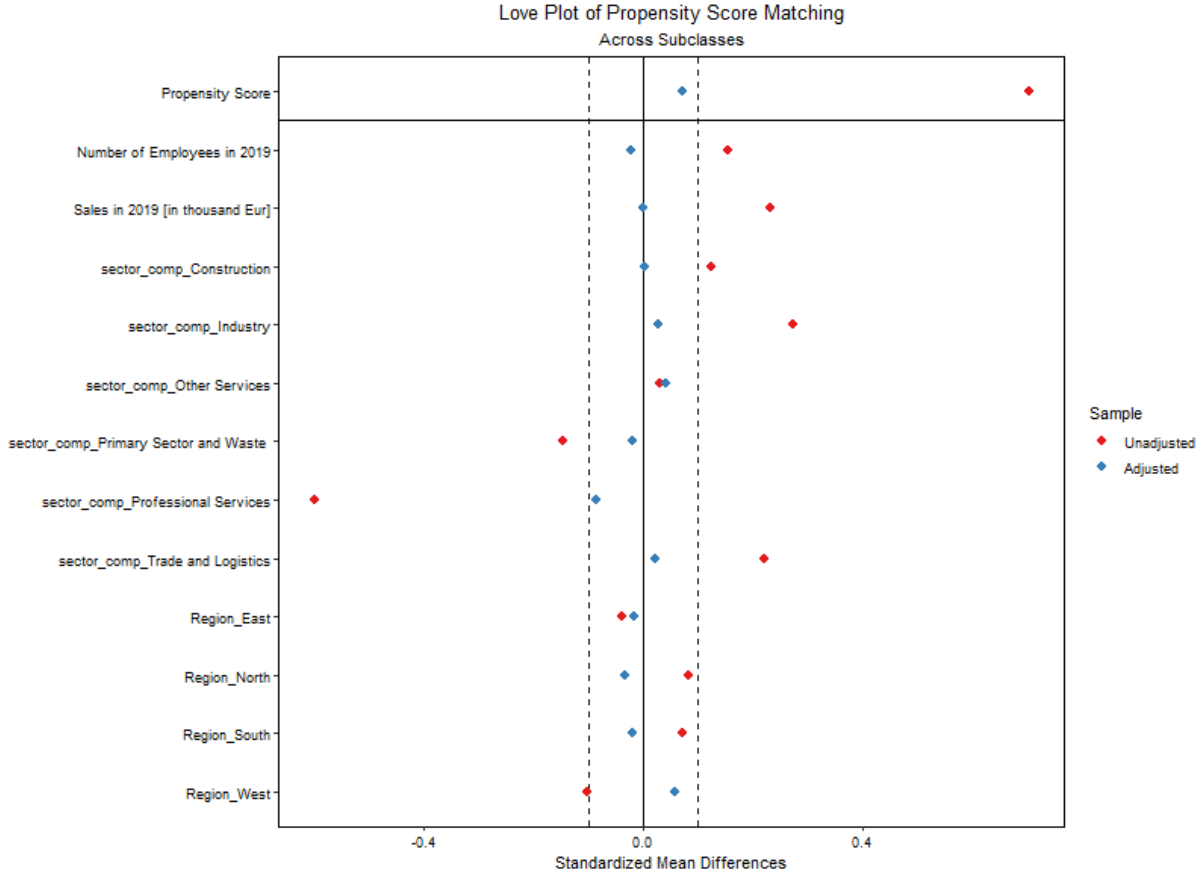


Table A4

Employment Reactions to Sales Shocks in Family and Nonfamily Firms, 2019-2020, Controlling for Non-Linear Size Effect

	Dependent variable:			
	Change in Employment [in log %]			
	(1)	(2)	(3)	(4)
Family Firm	-1.625 (1.703)	-0.994 (1.677)	-0.525 (1.697)	0.161 (1.691)
Sales Shock	0.239*** (0.050)	0.205*** (0.047)		
Idiosyncratic Sales Shock			0.215*** (0.054)	0.173*** (0.050)
Employees in 2019	0.001 (0.001)	0.0002 (0.001)	0.0003 (0.001)	-0.0001 (0.001)
Sales Expectations for 2022		0.158** (0.071)		0.199*** (0.075)
Change in Production Costs		-0.217 (0.203)		-0.225 (0.217)
Family Firm * Sales Shock	-0.108 (0.066)	-0.105* (0.060)		
Employees in 2019 * Sales Shock	0.0001 (0.0001)	0.0001 (0.0001)		
Family Firm * Idiosyncratic Sales Shock			-0.134** (0.063)	-0.124** (0.059)
Employees in 2019 * Idiosyncratic Sales Shock			0.0001 (0.0001)	0.0001 (0.0001)
Constant	2.250 (3.365)	2.673 (3.586)	1.952 (3.554)	2.374 (3.724)
Sectoral Controls	Yes	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes	Yes
Observations	495	481	495	481
R2	0.188	0.218	0.159	0.199
Adjusted R2	0.166	0.192	0.136	0.173
Residual Std. Error	19.727 (df = 481)	19.677 (df = 465)	20.077 (df = 481)	19.908 (df = 465)
F Statistic	8.568*** (df = 13; 481)	8.624*** (df = 15; 465)	6.991*** (df = 13; 481)	7.708*** (df = 15; 465)

Note:

*p<0.1; **p<0.05; ***p<0.01

Source: Forschungsdaten- und Servicezentrum (FDSZ) der Deutschen Bundesbank, Bundesbank-Online-Panel-Firms (BOP-F),10/2022-08/2024, own calculation.

Title	Questionnaire	Question	Transformation
Employment	5	<p>Approximately how many employees did your company have on December 31, 2019 and December 31, 2020?</p> <p>a Number of employees on December 31, 2019</p> <p>b Number of employees on December 31, 2020</p>	Calculation of the growth rate in log %; firms with 0 employees in both periods are excluded from the sample.
Sales Shock	5	<p>What was your company's turnover in 2019 and 2020? Please enter the amounts in full thousand euros.</p> <p>a Turnover (excluding VAT) in 2019</p> <p>b Turnover (excluding VAT) in 2020</p>	Calculation of the growth rate in log %.
Idiosyncratic Sales Shock	5	- based on sales -	Residuals of the regression: $[\log(\overline{sales_{i,2020}}) - \log(\overline{sales_{2020}})] = \beta_1 [\log(\overline{sales_{i,2019}}) - \log(\overline{sales_{2019}})] + \beta_2 sector_i + \beta_3 state_i + \varepsilon_i$
Family Firm	5	<p>How would you describe your company?</p> <p>Note: Please select all applicable answers.</p> <p>[a] An independent for-profit company that makes independent financial decisions</p> <p>[b] A branch of another company</p> <p>[c] A subsidiary of another company</p>	Dummy = 1 if family business is specified; non-profit organizations are excluded from the sample.

		<p>[d] A non-profit organization</p> <p>[e] A family business</p>	
Firm Size	5	- based on turnover and employment for 2019-	<p>As soon as both thresholds are exceeded, the company falls into the larger category:</p> <p>Micro firm = up to 9 employees and up to €2 million in sales.</p> <p>Small firm = up to 49 employees and €10 million in sales.</p> <p>Medium firm = up to 249 employees and €50 million in sales.</p> <p>Large firm = from 249 employees and €50 million in sales.</p>
		<p>How do you expect the following key figures to develop in your company at the end of 2022 compared to the end of 2019?</p> <p>1st answer option: decrease, by approx. ... %</p>	

		<p>2nd answer option: remain the same</p> <p>3rd answer option: increase, by approx. ... %</p>	
Sales Expectations for 2022	5	a Annual turnover:	No transformation
Expected Change in Employment for 2022	5	b Number of employees	No transformation
Change in Production Costs	5	e Average production costs	No transformation
		<p>Has your company used the following sources of financing in the last 3 months?</p> <p>1 = yes</p> <p>2 = no, but used in the period before that</p> <p>3 = no, never used before</p>	
Retained Profits	5	a Retained Profits	Dummy: 1 = 1 2
Bank Loan	5	b Bank Loan (without overdrafts)	Dummy: 1 = 1 2
Other Private Loan	5	c Bank overdrafts; e Trade credit (including advance payments and trade payables)	Dummy: 1 = 1 2; for one or both questions
Government Sponsored Loan	5	d State-sponsored loans	Dummy: 1 = 1 2
		<p>Has your company taken advantage of the following government aid offers since the beginning of the corona pandemic?</p> <p>1 = Yes</p> <p>2 = No, approval still pending</p> <p>3 = No, as no need</p>	

		<p>4 = No, as not approved / not granted</p> <p>5 = No, as offer of assistance not known</p> <p>-9996 = Does not apply to my company</p>	
KfW Loan	4 and 8	e KfW special program (= e.g. KfW-Corona-Schnellkredit or KfW-Unternehmerkredit)	Dummy: 1 = 1
Short-time work	4 and 8	d Short-time work	Dummy: 1 = 1
Emergency aid	4 and 8	a = Soforthilfe (03/2020 – 05/2020): b = Überbrückungshilfen I bis IV (since 06/2020)	Dummy: 1 = 1; for one or both questions
Sector	5 and earlier	<p>Which economic sector is your company most likely to belong to?</p> <p>Note: Please select an answer.</p> <p>1 = Agriculture, forestry and fishing 2 = Mining and quarrying, energy and water supply 3 = Sewage, waste management and remediation activities 4 = Food, beverages and tobacco 5 = Non-durable consumer goods 6 = Capital goods 7 = Capital goods and durable consumer goods 8 = Construction 9 = Wholesale trade; 10 = Retail trade 11 = Transportation and storage 12 = Information and communication 13 = Hotels and restaurants 14 = Financial and insurance activities 15 = Professional, scientific and technical activities 16 = Education and training 17 = Health and social work activities 18 = Other service activities 19 = Activities of membership organizations 20 = Public administration, defense and social security activities</p>	<p>Construction = Construction</p> <p>Industry = Food, beverages and tobacco, Non-durable consumer goods, Capital goods, Capital goods and durable consumer goods</p> <p>Other Services = Hotels and restaurants, Other service activities</p> <p>Primary Sector and Waste = Agriculture, forestry and fishing, Mining and quarrying, energy and water supply, Sewage, waste management and remediation activities</p> <p>Professional Services: = Information and</p>

			<p>communication, Professional, scientific and technical activities, Health and social work activities</p> <p>Trade and Logistics = Wholesale trade, Retail trade, Transportation and storage</p> <p>Sectors excluded: Financial and insurance activities, Education and training, Activities of membership organizations, Activities of public administration, Defense, Social security</p>
Federal state	5 and earlier	<p>In which federal state is your company headquartered in Germany?</p> <p>1 = Baden-Württemberg 2 = Bavaria 3 = Berlin 4 = Brandenburg 5 = Bremen 6 = Hamburg 7 = Hesse 8 = Mecklenburg-Western Pomerania 9 = Lower Saxony 10 = North Rhine-Westphalia 11 = Rhineland-Palatinate 12 = Saarland 13 = Saxony 14 = Saxony-Anhalt 15 = Schleswig-Holstein 16 = Thuringia</p>	<p>South = Baden-Württemberg, Bavaria</p> <p>West = Hesse, North Rhine-Westphalia, Rhineland-Palatinate, Saarland</p> <p>North = Bremen, Hamburg, Schleswig-Holstein. Lower Saxony</p> <p>East = Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt, Thuringia</p>



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UNIVERSITÄT
DUISBURG
ESSEN

Open-Minded



Institute for Socio-Economics
University of Duisburg-Essen

Lotharstr. 65
47057 Duisburg
Germany

uni-due.de/soziooekonomie
wp.ifso@uni-due.de



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