Eurasian Business Review (2023) 13:543–580
https://doi.org/10.1007/s40821-023-00248-1

REGULAR ARTICLE

Family firm performance in times of crisis—new evidence from Germany

Svenja Jarchow[1] · **Christoph Kaserer**[1] · **Henry Keppler**[1]

Received: 23 July 2021 / Revised: 3 April 2023 / Accepted: 20 May 2023 /
Published online: 21 June 2023

Abstract

Literature shows that founding-family control tends to positively impact firm performance and valuation. However, it is questioned whether this positive impact also persists in times of crisis or might even be reverted, as in such periods families could be focused on the survival of the firm even at the expense of long-term cash flows. By studying a large sample of listed German firms over the period 1998–2018, we document a significant outperformance of family firms in terms of ROA and (to a lesser extent) Tobin's Q during the crisis years 2008–2010 relative to their non-family counterparts. Moreover, this crisis resilience is more pronounced the stronger the family influence in terms of equity ownership. Outside the crisis period, there is only weak evidence for any outperformance. Digging deeper into this crisis effect, we find family firms to significantly reduce their leverage during the crisis. This, however, is not done at the expense of future cash flows, as we find weak evidence that family firms increase their capital expenditures as well as their employment relative to their non-family counterparts. Given that these results also hold in a dynamic panel system GMM approach and withstand a battery of robustness tests, we hope to add new evidence on the drivers of family firm performance.

Keywords Family firm performance · Agency theory · Ownership structure · Crisis management

JEL Classification G01 · G32 · G34 · G35

✉ Christoph Kaserer
christoph.kaserer@tum.de

Svenja Jarchow
jarchow@tum.de

Henry Keppler
henry.keppler@tum.de

[1] Center for Entrepreneurial and Financial Studies (CEFS), Technical University Munich (TUM), Arcisstrasse 21, 80333 Munich, Germany

1 Introduction

Although evidently, every crisis differs in its impact and influence on the economy, a thorough understanding of firm behavior and firm success factors during economic crises can help our understanding of what builds a long-term sustainable company. Family firms are a ubiquitous organizational structure among listed and unlisted firms around the world (Faccio & Lang, 2002). They are at the center of controversial discussions regarding governance and financial structures. Thus, understanding what drives differences in family firm performance in times of crisis can provide insights into firm resilience during economic stress.

It has been extensively shown in the literature that family ownership impacts, among others, operating firm performance and valuations (Amit & Villalonga, 2014; Villalonga & Amit, 2006, 2009). A standard argument in this context is that a family as an active block-holder mitigates agency conflicts arising from the separation of ownership and control (Miguel et al., 2004). This is further enhanced through board membership which can decrease monitoring inefficiencies and informational asymmetries (Villalonga et al., 2015). Furthermore, founding families, as opposed to other block-holders, exhibit additional characteristics, such as deep knowledge of the firm, emotional and reputational involvedness (Block, 2012; Gómez-Mejía et al., 2007), or the ability to maintain long-term implicit contracts with employees (Mueller & Philippon, 2011). Yet, due to a limited human capital pool, all benefits need to be weighed against the negative impact of potentially inferior management and monitoring capability (Burkart et al., 2003). This leaves doubt especially in situations of financial distress, whether family firms are really better off than non-family firms.

In fact, Lins et al. (2013) show in an international family firms sample that during the financial crisis, performance was worse in terms of their stock returns. The result is mainly driven by investment cuts. They argue that in times of crisis, families take actions primarily targeted at ensuring firm survival and thus, the protection of the family's private benefits at the expense of long-term cashflows. Meanwhile, Minichilli et al. (2016) show in a sample of Italian family firms an outperformance throughout the crisis. Among these, family firms with a family CEO in combination with an overall lower family ownership concentration results in a better performance than a family CEO and high family ownership. A broader meta-analysis by Hansen et al. (2020) investigates the influence of family ownership on performance over business cycles. They can't show a relevant outperformance of family firms in general nor for crisis times in developed countries. Yet, they acknowledge differences among regions and with regards to family firm definition.

Altogether, several questions remain unanswered. The study of Lins et al. (2013) analyzes a large international sample at the expense of information on the ownership structure, therefore not being able to deeply dig into control and governance characteristics. Moreover, they find significant cross-country heterogeneity indicating that the benefits of family control might be very different from country to country. In this regard, the paper of Minichilli et al. (2016) has the advantage of focusing on one country, i.e. Italy. Yet, apart from the fact that the paper doesn't account for a founding-family definition either, it also doesn't scrutinize the specific drivers that might explain the crisis outperformance of family firms. Again, Hansen et al. (2020) provide an overview through their meta-analysis and clearly reveal the difficulties of generalized statements. They can't provide a deep look into the influence of family firm definition, yet they provide evidence that country differences matter in the assessment of family firm performance during the crisis. This is where our paper aims to make a contribution.

We analyze a sample of 798 listed German companies over the period 1998–2018 leading to 8093 firm-year observations. The German setting allows us to investigate a country with a unique two-tier board system, underdeveloped stock markets, a strong bank-oriented financial system, a powerful family tradition in the overall economy, highly concentrated ownership structures even among listed firms, and comparably low leverage ratios in family firms (this list builds on Ampenberger et al., 2013). In addition, our granular data structure allows us to account for differences in family influence. By following the founding-family firm definition, we identify roughly 45% of our observations to belong to family firms. In a fixed effects regression, we document that listed German family firms significantly outperformed their non-family counterparts in terms of ROA as well as—to a less robust extent—Tobin's *Q*.

However, this outperformance mostly disappears once a crisis dummy covering the period 2008–2010 is introduced. In fact, our results indicate that the outperformance of family firms mostly happens during the times of the global financial crisis and the Euro sovereign debt crisis. As the result also holds for Tobin's *Q*, the findings are in contrast to those reported by Lins et al. (2013). Moreover, the positive family control impact becomes stronger the narrower the family firm definition is. The strongest results are found for those family firms where the founder is still active on the management or supervisory board.

By digging deeper into the channels responsible for this outperformance we first find that family firms were able to significantly reduce their leverage. However, this wasn't done at the expense of long-term cash flows. In fact, our findings suggest that family firms have increased their capital expenditures during the crisis relative to their non-family peers. At the same time, we do not find clear evidence that they were able to do so because of better access to external capital during the crisis. It rather seems that family firms were simply better prepared for the crisis by following a more conservative payout policy beforehand.

Overall, our results add to the understanding of the impact of family control on firm performance and valuation. While our results only add limited evidence in favor of the hypothesis that family firms outperform in general, we present evidence in favor of outperformance during crisis times.

2 Literature review and hypotheses

2.1 Family influence and firm performance

Our starting point are the seminal papers of Villalonga and Amit (2009) and Amit and Villalonga (2014) showing that family ownership has a significant influence on valuation and performance. Yet, when taking a closer look at the performance of family firms compared to non-family firms, literature gives controversial findings (for meta-analyses see e.g. Hansen & Block, 2020; O'Boyle et al., 2012; Wagner et al., 2015). Differences are strongly driven by family firm definition and country selection. Also, outperformance seems to be more pronounced in listed (Hansen & Block, 2020; Taras et al., 2018; van Essen et al., 2015a) as well as large family firms (Hansen & Block, 2020). Firms that replaced their CEOs prior to the crisis outperformed those that didn't (Cucculelli & Bettinelli, 2016), while during the crisis family and non-family firms withdraw from CEO turnover decisions in general (Visintin et al., 2017). In addition, industry affiliation and variation in economic conditions between observed time periods account for performance differences (Amit & Villalonga, 2014).

In family firms large family shareholders are incentivized to thoroughly monitor the management and thereby reducing agency conflicts (Miguel et al., 2004). Family firms are also bound for a long-term orientation that goes along with an alignment of interest among shareholders and management (Kappes & Schmid, 2013). This is further enhanced through board membership, where ownership and management become partially overlapping, thus decreasing monitoring inefficiencies and information asymmetries (Villalonga et al., 2015). To account for blockholder versus family influence, we thus control for shareholder concentration in our regressions.

However, founding families, as opposed to other block-holders, come along with additional characteristics. First, the deep knowledge a founder or family member has, can improve monitoring and strengthen long-term thinking (Block, 2012). In addition, the emotional and reputational involvedness adds a further family-specific monitoring incentive. Yet, due to a limited human capital pool within the family, all benefits need to be weighed against the negative impact of potentially inferior quality of management as well as monitoring capability (Bennedsen et al., 2007; Burkart et al., 2003). Furthermore, families are undiversified shareholders and thus show risk avoidance which might lead to costs for the firm (Shleifer & Vishny, 1986). This has been a prominent argument in studies of the Asian crisis where investment cuts are driven by family firms to ensure the survival of the firm as a whole (Hansen et al., 2020; Lins et al., 2013). In addition, they are known for a generally more cautious investment strategy, and especially in Germany also lower debt levels (Schmid, 2013). This could lead to flexibility in times of crises, yet could also inhibit further development if investments are held back for too long.

Also, as large block-holders, they could expropriate minority shareholders, especially in times of crisis (Mitton, 2002). In terms of dividend payments, family firms have been shown to reduce dividends yet extract retained earnings for their private benefits during the Asian crisis (Attig et al., 2016). This leaves doubt especially in situations of financial distress, whether family firms ultimately show a better performance than non-family firms. The latter might be able to draw on a more experienced management and in case of other block-holding shareholders also on highly experienced financial advisors (i.e., in the case of private equity ownership).

Literature on family firm performance during the financial crisis There are not many, but at least a few papers that have covered the financial crisis and the effect of firm ownership. In addition, literature on the earlier Asian crisis should be taken into account as well as some studies on economic cycles and economic downturns whose results might be transferable to the financial crisis.

First, Lins et al. (2013) show in a sample of 8500 firms in 35 countries that the stock return underperformance of family firms is mainly driven by investment cuts. It should be noted that they use a family firm definition which is based on the existence of a block-holding family. They do not take into account whether this is the founding family nor specify ownership thresholds concerning veto rights for the family firm definition. Even though they acknowledge country differences, they cannot find evidence for specific country settings that would overcome the underperformance of family firms throughout the crisis. Meanwhile, Minichilli et al. (2016) show in their Italian sample that family firms outperform non-family firms throughout the crisis. Again, this paper does not use a founding-family definition. They find that outperformance depends on the relation between family ownership concentration and the existence of a family CEO. It seems that in crisis times the family CEO in combination with an overall lower family ownership concentration results in a better performance than with a family CEO and high family ownership. They argue that family firms change their risk attitude during the crisis and to sustain the family wealth are more willing to use external credit. This enables further investments and thus increases firm profitability. This is in line with the notion that family firms experience better credit conditions during crises (D'Aurizio et al., 2015).

Meanwhile, van Essen et al. (2015b) show in a European cross-country analysis of listed firms an outperformance of family firms during the financial crisis. Similarly, Zhou et al. (2017) show for a sample of S&P 500 firms that family influence is decisive in terms of higher performance. The main driver of this finding is Founder-led family firms. In a Belgian context, Bauweraerts (2013) finds evidence for an outperformance of private family firms in times of crisis. Similar is found by Arrondo-García et al. (2016) for Spanish firms.

In addition, some studies have concentrated on times of economic distress and its influence on family firms versus non-family firms. While Hansen et al. (2020) do not find an outperformance of family firms in times of economic distress, Škare and Porada-Rochoń (2021) find in a European sample a higher resilience of family firms over economic cycles in general. In a recent study, Gómez-Mejia et al. (2021) can show in a model and subsequently confirm through a Swedish dataset the moderating role of family control for risk-taking behavior and performance under stress.

Besides addressing the 2008 financial crisis (Lins et al., 2013; Minichilli et al., 2016; van Essen et al., 2015b) there are several studies on the 1997 Asian financial crisis (e.g.Baek et al., 2004; Lemmon & Lins, 2003). Again, this literature stream shows inconclusive results. While arguments are found for higher stability of family firms (Allouche et al., 2008; Amann & Jaussaud, 2012), other findings see lower stock returns (Lemmon & Lins, 2003) and a negative impact of family ownership concentration (Baek et al., 2004).

Recently, some studies have come up that address the Covid-19 crisis in the context of firm resilience to external shocks. There are first indications that family influence has a positive impact on financial performance during such a crisis (Amore et al., 2022). Also, an interview study by Kraus et al. (2020) in five European countries provides evidence that family firms employ a plethora of measurements in correspondence to the strength with which they are hit by the crisis. This in turn depends strongly on the industry they are involved in but also on the size of the company. Among the measures taken, liquidity takes on a central role. Yet, more work will have to be conducted in this regard to disentangle the multiple influences during the Covid-19 crisis.

All in all, we can conclude that evidence is still inconclusive regarding the question of whether, and if so, how family ownership influences firm performance during times of crises. Investigating German family firms in this regard can add to the literature given the overall size of the economy and the relative importance of family-led corporations. Hence, starting from the evidence presented so far, we derive the following first hypotheses:

H1a German listed family and non-family firms show differences in their performance during the financial crisis.

H1b The differences become more pronounced, the stronger the influence of the founding family is.

2.2 Financial structure and firm performance

When it comes to the question why family firms may outperform in times of crisis an important argument is their close relationship with debt providers (Wenger & Kaserer, 1998). Cheaper access to debt for family firms as well as continuous access also in times of economic crises have been shown in several studies (e.g., D'Aurizio et al., 2015; Stacchini & Degasperi, 2015). Less clear, however, is the role of the level of indebtness, i.e. whether family firms have more or less leverage. Contradicting results can be found in the literature (Ampenberger et al., 2013; Anderson & Reeb, 2003b; Anderson et al., 2003; Gómez-Mejía et al., 2007; Villalonga & Amit, 2006).

González et al. (2013) show that the debt level largely depends on the level of involvement the family has in the respective firm. Moreover, the law-and-finance environment of the respective jurisdiction might play a role, favoring less leverage in countries of tight creditor monitoring (Ampenberger et al., 2013). In Germany, the bank-based economy enhances a less leveraged family-firm structure (Ampenberger et al., 2013). Yet, in times of crisis, the bank orientation, with strong personal relationships between lenders and banks (Wenger & Kaserer, 1998) could also lead to higher use of leverage to support future investments and a long-term orientation of the firm. Recent studies on the Covid-19 crisis point out that less leveraged firms might have an advantage over more leveraged firms in times of crisis as they maintain higher financial flexibility (Ding et al., 2021).

H2a Listed family firms decrease their leverage in times of crisis relative to listed non-family firms.

Besides the ability to raise financing, also the payout policy can influence a company's available capital. There is an ongoing debate on the payout policy of listed firms. For one side, payouts are seen as positive signaling for minority shareholders which favor higher dividends (La Porta et al., 2000). On the other side, lower payouts leave more money in the firm and give thus a higher degree of freedom in terms of investments. This might be favored by family owners as they can promote their own projects within the firm (Johnson et al., 2000). Yet, families could also be interested in higher payouts as they need the dividends for their own wealth as undiversified shareholders (Isakov & Weisskopf, 2015).

Overall, the literature has presented differing results in this regard. In an analysis of a European dataset, family firms are assigned a higher and more stable payout policy (Pindado et al., 2012). For Germany, there are papers showing a lower dividend payout policy of family firms compared to non-family firms (Gugler, 2003) and others that indicate family ownership as a driver for a higher payout policy (Schmid et al., 2010). Isakov and Weisskopf (2015) show that higher dividends are paid by family firms of later generations and with higher family influence.

There are only a few studies that take a closer look at payout policies during times of crisis. A cross-country Asian study shows lower dividend payouts and a negative relationship between family control and payout ratios during the 2008 financial crisis (Attig et al., 2016). In this paper we ask the question, of whether, and if so, to what extent, the crisis-induced change in the family-firm leverage relative to non-family firms is caused by a change in the payout policies of these firms relative to their non-family firm counterparts.

H2b Listed family firms have a more restrictive payout policy during crisis periods compared to non-family firms, thus giving them more financial flexibility during the crisis.

Finally, we are interested in understanding whether crisis-induced adjustments of financial policies in family firms harm the long-term perspectives of the company. In line with the literature, but nevertheless simplified, we assume long-term perspectives to be correlated with investments and employment. As an alternative, we could focus on research & development (R&D) spendings, which is also commonly done in the literature. Yet, as not every firm is R&D intense and R&D reporting is prone to opportunistic under-reporting (Schmid et al., 2014), capital expenditures (capex) and employment can be taken as common measures of investment. Lins et al. (2013) base their argument of reduced investments through family firms during the crisis on a significantly lower capex which in their findings drives the underperformance of family firms. Previous papers have documented an investment reduction during the crisis based on financial constraints of the corresponding firms (Campello et al., 2010). Yet, in times of financial constraints, risk-taking behavior might differ with regard to a higher willingness for investments to ensure firm preservation (Minichilli et al., 2016). Therefore, even steady-state risk-averse family firms might draw on higher investments during a crisis to safeguard the company (Patel & Chrisman, 2014). As a consequence, we test the following hypothesis:

H2c Listed family firms have higher investments in terms of capital expenditures and higher employment during times of crisis compared to listed non-family firms.

The great number of varying results in family firm literature shows that family firm definitions (e.g. Maury, 2006; Miller et al., 2007), institutional context (Antoniou et al., 2008; La Porta et al., 1999; Lohwasser et al., 2022) and cross-country variation play a major role in any family firm study (e.g. Lins et al. 2013; Zhou et al. 2017).

Besides the especially long tradition (Fohlin, 2007) and strong prominence of family firms (Schmid et al., 2015), the German bank-based financial system has been found to lead to contradicting findings compared to other country and cross-country studies (Schmid, 2013). In this, especially debt seems to be more reluctantly treated (Ampenberger et al., 2013) as Germany is a country with a high level of creditor monitoring thus giving more rights also to debt holders (Schmid, 2013). In addition, German stock markets are comparably underdeveloped (e.g., Theissen, 2004) and Germany exhibits a differing legal and institutional environment (Ampenberger et al., 2013).

3 Data and methodology

3.1 Family firm definition

The literature offers a broad spectrum of family firm definitions (Taras et al., 2018). We generally follow Anderson and Reeb (2003a) in linking the family firm characteristic to the founder and his or her relatives. Villalonga and Amit (2006, p. 389) define a family firm as a firm "in which the founder or a member of his or her family by either blood or marriage is an officer, director, or block-holder, either individually or as a group." Taking the German system of corporate governance into account we differentiate three different types of family influence, namely management, governance and ownership (Astrachan et al., 2002).[1]

Through the two-tier board structure, Germany prescribes a strict separation of the day-to-day management done by the management board and monitoring activities being the responsibility of the supervisory board (e.g., Fauver & Fuerst, 2006). We presume family influence in management or governance if the founder or his or her relatives or descendants are members of the company's management board or supervisory board respectively. Independently of these two criteria we also assume family influence, if the family controls more than 25% of the voting rights, as this reflects the blocking minority for German joint-stock companies. In this case, the family is assumed to have the ability to exercise control over the company (Schmid et al., 2015). Our basic definition characterizes a firm as a family firm if at least one of the three components enables family influence for a given year.

The positive effects of family involvement on firm performance are largely dependent on the family's type and strength of influence (Chua et al., 2012; Taras et al., 2018). The more the family involvement overcomes the separation of ownership and control, the more it is suitable to reduce the principal-agent conflict. Hence, we introduce a narrow definition of family firms where this separation of ownership and control is overcome to some extent. This is assumed to be the case if the founding family controls more than 25% of the voting rights and additionally participates in the management or supervisory board.

Based on the *Narrow* definition we introduce a third definition of Founder-led family firms, for which only the founder of the company is operationally involved in the management or supervisory board. Founder-led firms are associated with better firm performance compared to family firms led by later generations (Miller et al., 2007; Pérez-González, 2006; van Essen et al., 2015a). The influence of the founder was also recognized in times of crisis and found to be the driver for the outperformance of family firms (Zhou et al., 2017).

3.2 Performance measures and control variables

Family firm performance literature widely uses ROA as an operational performance measure (Azila-Gbettor et al., 2018; Massis et al., 2015). Thus, in line with existing research, we use ROA as the main performance measure (Anderson & Reeb, 2003b; Barontini & Caprio, 2006; Villalonga & Amit, 2006). We define ROA as the company's earnings before interest and taxes (EBIT) in a given year divided by its total assets. Moreover, we analyze whether the market incorporates ownership information in firm valuation. For this purpose, we also include Tobin's *Q* in our analysis (Azila-Gbettor et al., 2018). Tobin's *Q* is measured as total assets plus the market value of equity minus the book value of equity, all divided by total assets. All dependent variables are winsorized at the 1% and 99% percentiles respectively.

[1] The two-tier board system in Germany separates the management and supervision of listed companies, prescribing them to have separate management and supervisory boards.

Table 1 Description of variables used

Variable	Description
Family firm characteristics	
Basic	A dummy taking the value 1 if the founding family holds minimum one position in the company's board of directors, holds minimum one position in the company's supervisory board, or owns minimum 25% of the voting rights
Narrow	A dummy taking the value 1 if the founding family owns minimum 25% of the voting rights and holds minimum one position in the company's board of directors or holds minimum one position in the company's supervisory board
Founder-led	A dummy taking the value 1 if the company meets requirements following the narrow definition and the founder of the company is the only family member who holds a position in the company's supervisory or management board
Eq	A dummy taking the value 1 if the founding family holds minimum 25% of the voting rights
MB	A dummy takting the value 1 if the founding family holds minimum one position in the company's board of directors
SB	A dummy takting the value 1 if the founding family holds minimum one position in the company's supervisory board
Performance	
Return on assets	The company's EBIT divided by the total assets
Tobin's *Q*	(Market value equity − book value equity + total assets)/total assets
Governance structure	
Shareholder concentration	The Herfindahl–Hirschman Index of the shareholding of the company's shareholders
Shareholder concentration (Top 3)	Ownership percentage controlled by the top 3 shareholders
Num. management board	The total amount of members in the company's management board
Num. supervisory board	The total amount of members in the company's supervisory board
Dividend policy	
Retained earnings	The logarithm of the company's retained earnings
Payout ratio	The company's paid dividends divided by its net income
Size	
Total assets	The logarithm of the company's total assets
Age	The logarithm of the company's age since incorporation
Investment activity	
Capex	The logarithm of the company's capex
Employment	The logarithm of the number of the company's employees
Leverage	
Debt ratio	The company's book value of interest bearing debt divided by the book value of equity
Risk	
Beta	The company's yearly beta calculated based on the average of the company's monthly betas for the respective year
Fixed effects	
Year	Fixed effects for the year

Table 1 (continued)

Variable	Description
Industry	Fixed effects for the main industry the company is active in based on the first two digits of the Standard Industry Classification code
Crisis	
Crisis	A dummy variable set to one for the years 2008 to 2010 and otherwise zero

We additionally introduce control variables to account for firm characteristics following other studies in the field of family business performance (Azila-Gbettor et al., 2018). A description of all variables can be found in Table 1. We control for company size by including the companies' total book value of assets as well as the company's age since incorporation. For the regressions, we include the logarithm of both.

We control for shareholder structure by measuring shareholder concentration. Existing research draws on various definitions of shareholder concentration (Overland et al., 2020). In order to capture the role of ownership with regard to corporate governance and control aspects, we define shareholder concentration as the Herfindahl concentration index, which is the sum of the squared shareholdings of the company's shareholders. Following Villalonga and Amit (2006), we additionally control for differences in board size by including the number of management and supervisory board members as control variables. Analogous to other studies in the field we additionally include the companies' annual betas to control for risk levels and the companies' debt ratios to control for different capital structures (Anderson & Reeb, 2003a; Miller et al., 2007; Villalonga & Amit, 2006). We furthermore include industry and year-fixed effects thus accounting for unobserved heterogeneity, i.e., unobserved industry and time-specific variables influencing our variables of interest (Amit & Villalonga, 2014).

Finally, in line with Lins et al. (2013), we define the beginning of the crisis period to be in 2008. This contradicts the definition of Minichilli et al. (2016) who define 2010 as the first year within the crisis period in the European context. We choose an overall broader crisis period than Lins et al. (2013) as in a European context it is very hard to separate the financial crisis from the European sovereign debt crisis. Thus, we broaden the time span from 2008 to 2010 and will also look at alternative definitions of the crisis period. As our sample covers the period until 2018, contrary to Minichilli et al. (2016) and Lins et al. (2013) we have a relatively long after-crisis period in our data allowing us to better disentangle crisis- from non-crisis-behavior.

3.3 Methodology

First, we run pooled OLS regressions with year and industry-fixed effects. However, it is well known that in such a setting we cannot control for unobserved endogeneity and simultaneity issues. In fact, it has been clearly pointed out in the literature that empirical corporate finance research is affected by endogeneity issues (Roberts & Whited, 2013). This is even more true in the context of corporate governance studies, where corporate performance is used as a dependent variable (e.g., Anderson & Reeb, 2003a; Basco et al., 2019; Bertrand & Schoar, 2006; Faccio et al., 2011; Lahouel et al., 2019; McWilliams & Siegel, 2000; Sardo et al., 2021; Villalonga & Amit, 2006; Wintoki et al., 2012).

Based on extensive statistical literature initiated by Hansen (1982) and Arellano and Bond (1991) we follow the work of Wintoki et al. (2012) in implementing a dynamic panel system GMM estimation in order to get consistent and unbiased estimates. In this way, we should be able to account for temporal dependencies in our variables of interest, most importantly in the corporate performance variables. A comprehensive discussion of the advantages of such a modeling in a corporate governance context can be found, among others, in Wintoki et al. (2012) or Lahouel et al. (2019). We implement the system GMM in Stata following the guidelines set out in Roodman (2009).

It should be noted that in a GMM the set of instruments and the number of lags are choice variables that can hardly be justified purely on an economic rationale. Following Wintoki et al. (2012) we want to make sure to have included enough lags to control for the exogenous firm characteristics. Therefore, we use the minimum number of lags necessary in order to pass the AR (1) (rejection), AR (2) (no rejection), and the Hansen test of overidentification (no rejection).[2] The importance of these test-statistics for the validity of the instrumental variables is also emphasized in Lahouel et al. (2019). For the instruments, we use all control variables except for those that seem to be almost time-invariant. In our case, this applies to the total number of management or supervisory board members. This can also be justified in an analysis in the spirit of Wintoki et al. (2012). In fact, when running a pooled OLS regression similar to the one in Table 5 but including up to three lags in the dependent variable, all control variables with the exception of the two mentioned before are significant either at lag 0 or 1.

3.4 Data and descriptive statistics

Our unbalanced panel data set of listed German non-financial firms between 1998 and 2018 comprises 798 companies and 8093 firm-year observations. Following Schmid et al. (2015) we use the Composite German stock index (CDAX) as a starting point which we take from the CDAX composition published by Deutsche Börse AG for each observed year. The CDAX encompasses all companies listed in the Prime or General Standard of the Frankfurt Stock Exchange, thus representing the entire breadth of the regulated German stock market. Following Anderson and Reeb (2003a) and Schmid et al. (2015) we exclude financial and real estate companies (Standard Industry Classification (SIC) Code 6) due to limited comparability of accounting and market performance variables. Additionally, inactive companies, e.g., stocks of companies that declared insolvency or companies without notable

[2] There was one case, namely the regressions using CAPEX as the dependent variable in Table 9, where these three tests were not passed simultaneously. We decided to put the least emphasis on the AR (2) test leading to a specification where second order autocorrelation could not be rejected.

Table 2 Sample composition per year

Year	Total	Basic definition		Narrow definition	
		Family firms	% of total	Family firms	% of total
1998	294	100	34%	66	22%
1999	414	193	47%	134	32%
2000	547	300	55%	196	36%
2001	550	304	55%	185	34%
2002	487	243	50%	151	31%
2003	452	225	50%	143	32%
2004	442	215	49%	124	28%
2005	431	203	47%	107	25%
2006	433	205	47%	102	24%
2007	436	199	46%	100	23%
2008	421	184	44%	94	22%
2009	378	161	43%	69	18%
2010	360	154	43%	70	19%
2011	354	149	42%	68	19%
2012	348	141	41%	69	20%
2013	327	131	40%	59	18%
2014	294	117	40%	52	18%
2015	283	111	39%	46	16%
2016	281	105	37%	48	17%
2017	280	103	37%	45	16%
2018	281	105	37%	43	15%
Sum	**8093**	**3648**	**45%**	**1971**	**24%**

Number of firms per year for basic and narrow family firm definition. Descriptive statistics are provided for the full sample of 8093 observations for CDAX companies in the period 1998–2018

revenue solely engaged in research and development activities, are eliminated. In line with Schmid et al. (2015), the firm's common stock needs to be listed for at least one year of the sample period in the CDAX. Thus, we receive an unbalanced panel consisting of both active and inactive firms.

We use Thomson Reuters' *Datastream* database as primary source for companies' market and accounting data. In addition, we draw on Bureau van Dijk's *Amadeus* database as well as the companies' published annual reports as secondary sources. The family firm determinants management members and supervisory board members are taken from Bisnode's *Hoppenstedt Firmendatenbank* database. The voting rights are taken from Bureau van Dijk's *Orbis* database. Again, we complement and validate this information with publicly available information drawn from annual reports and company websites. From the latter two sources, we also obtain the companies' incorporation and IPO information, including details on the companies' founders. In cases where the respective company has more than one founder, we follow Schmid et al. (2015) and include all founders in the analysis by cumulating the combined ownership shares of all founding family members for one company.

For companies, without a founder (i.e., 16 formerly state-owned companies that were privatized and 27 spin-offs from corporations) no founder is included and these companies are therefore by default in the non-family sub-sample.

Table 2 provides a sample overview over the period 1998–2018. It also contains information for our two main definitions of family firms, i.e., *Basic* and *Narrow*.[3] Our total sample has a size of 8093 firm-year observations, of which 3648 are associated with family firms following the *Basic* definition, equaling 45%, and 1971 following the *Narrow* definition, equaling 24%. Over our observation period, the total number of firms is strongly increasing during the dot-com boom until 2000 and then notably declined until 2018, reducing to only 51% of the maximum in 2001.[4]

Table 3 provides an overview of the descriptive statistics for all performance measures and control variables. With regards to profitability, results for the descriptive statistics are notably mixed, depending on the family firm definition used. Family firms following the *Basic* definition are significantly less profitable compared to non-family firms. The mean return on assets for family firms is 0.3% (median 5.8%) and 3.5% (5.8%) for non-family firms. The difference in means is significant at the 1% level. When comparing Tobin's *Q*, we find family firms to have higher market values compared to non-family firms.

Yet, family firms perform differently when applying the *Narrow* definition. In this case, family firms show a tendency to outperform, particularly regarding return on assets with a mean of 2.4% vs 2.0% for non-family firms and a median of 6.4% vs 5.6%. The difference in the median is significant at the 1% level. Hence, the more restrictive definition leads to a selection of a better-performing sub-sample, indicating a potential impact of managerial or controlling involvement of the family.

Descriptive statistics for shareholder concentration remain inconclusive, even though significant. Family firms following the *Basic* definition have a significantly lower shareholder concentration compared to non-family firms. For the *Narrow* definition, mean values point in the same direction; median values vice versa. Regarding the number of management board members, there is only a slight indication that non-family firms have larger management boards. However, the number of supervisory board members is significantly different at the 1% level. The median family firm has 3 supervisory board members vs 6 for non-family firms. This also relates to the fact that family firms are smaller and younger than non-family firms. The mean total assets following the *Narrow* definition is EUR 619.64 million for family firms and EUR 5.78 billion for non-family firms, a sizeable and significant difference. The average company age following the *Narrow* definition is 36 years for family and 58 years for non-family firms. The large difference between mean and median reflects the skewness of the distributions for total assets and company age. All differences in mean and median except for the median number of management board members are significant at the 1% level.

Family firms employ less financial leverage compared to non-family firms. The mean debt ratio for family firms is 0.32 following the *Basic* and 0.27 following the

[3] The *Founder-led* definition is not included in the descriptives for simplification purposes. It is however included in the multivariate regression results.

[4] Additional detailed information on the sample composition with regards to the corresponding SIC-codes is available upon request.

Table 3 Descriptive statistics for operational performance measures and independent variables

		Family firm			Non-family firm			Significance		
		Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Sum Obs.
Return on assets (in %)	Basic	0.3%	5.8%	3434	3.5%	5.8%	4218	***	*	7652
	Narrow	2.4%	6.4%	1851	2.0%	5.6%	5801	n.s	***	7652
Tobin's Q (abs.)	Basic	1.72	1.31	3206	1.50	1.22	3615	***	***	6821
	Narrow	1.76	1.29	1759	1.54	1.25	5062	***	***	6821
Shareholder concentration (abs.)	Basic	0.22	0.18	3621	0.32	0.23	4365	***	***	7986
	Narrow	0.25	0.23	1971	0.28	0.17	6015	***	***	7986
Num. management board (abs.)	Basic	3.03	3.00	3648	3.13	3.00	4445	***	n.s	8093
	Narrow	3.02	3.00	1971	3.11	3.00	6122	**	n.s	8093
Num. supervisory board (abs.)	Basic	5.25	3.00	3648	8.01	6.00	4445	***	***	8093
	Narrow	4.89	3.00	1971	7.37	6.00	6122	***	***	8093
Retained earnings (in Mn. EUR)	Basic	532.12	6.07	3273	920.55	284.50	4125	***	***	7398
	Narrow	146.93	6.65	1780	939.37	18.88	5618	***	***	7398
Payout ratio (abs.)	Basic	0.38	0.00	3159	1.03	0.08	3961	n.s	***	7120
	Narrow	0.45	0.00	1713	0.83	0.00	5407	n.s	n.s	7120
Total assets (in Mn. EUR)	Basic	2245.22	94.42	3512	6389.47	258.12	4235	***	***	7747
	Narrow	619.64	89.54	1901	5776.03	196.31	5846	***	***	7747
Company age (in years)	Basic	35.90	21.00	3648	66.41	50.00	4444	***	***	8092
	Narrow	35.99	21.00	1971	58.02	33.00	6121	***	***	8092
Capex (in Mn. EUR)	Basic	97.11	4.00	3233	363.94	12.15	4095	***	***	7328
	Narrow	28.03	3.93	1762	315.29	9.07	5566	***	***	7328
Fixed assets (in Mn. EUR)	Basic	1438.75	39.10	3191	4077.55	133.92	4010	***	***	7201
	Narrow	389.25	35.28	1733	3706.56	95.71	5468	***	***	7201
Debt ratio (abs.)	Basic	0.32	0.16	3387	0.44	0.22	4010	***	***	7397

Table 3 (continued)

		Family firm			Non-family firm			Significance		
		Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	Sum Obs.
	Narrow	0.27	0.15	1857	0.42	0.21	5540	***	***	7397
Risk (beta)	Basic	0.70	0.63	3287	0.56	0.51	4105	***	***	7392
	Narrow	0.67	0.61	1740	0.61	0.55	5652	***	***	7392

Mean, median, number of observations, and test for differences in means between family and non-family firms for operational performance measures as well as independent variables used for multivariate regression. Family firms are identified based on basic and narrow family firm definition. Descriptive statistics are provided for the full sample of 8093 observations for CDAX companies in the period 1998–2018. A two-sample *t*-test is applied for testing differences in means. For testing the differences in median, a Wilcoxon rank-sum test is applied for each variable. Illustration of significance level with * (10%), ** (5%), *** (1%), n.s. (not significantly different)

Narrow definition. For non-family firms, this is 0.44 and 0.42 respectively. This is in line with the presumed more conservative investment behavior found by Faccio et al. (2011). The differences in financial leverage are significant at the 1% level. Interestingly, this is not reflected in the firms' betas, as family firms have a significantly higher beta than non-family firms. This might be due to the fact that non-family firms are larger and therefore more diversified. However, this difference in market risk is largely driven by the time period 1998–2004. After 2004 we find no concluding evidence for a difference in betas between family and non-family firms.[5]

4 Results and discussion

4.1 Regression results

For our statistical analysis, we test the dependency of the performance measures ROA and Tobin's *Q* on three different definitions of family firms. Our key analysis starts with a pooled OLS regression with robust standard errors and additionally controls for industry and year-fixed effects in order to isolate effects originating in industry-specific family firm characteristics and time-dependent effects. As already explained, we then perform a dynamic panel system GMM in order to overcome biases caused by endogeneity and simultaneity.

Table 4 reports the results of our main regressions using ROA as dependent variable. The varying definitions for family firms are shown in the different columns. We include the family firm characteristic as a dummy variable that takes the value 1 if the company is a family firm in a given year and 0 otherwise. In order to identify the performance of family firms during crisis times we include an interaction term of the family firm dummy with a crisis dummy. The latter is set to 1 for the years 2008–2010 and 0 otherwise.

Most importantly, we see that regardless of the family firm definition these interaction terms are positive and statistically significant in all specifications. Hence, compared to their non-family counterparts, family firms outperform during crisis times in terms of ROA. The evidence for a general outperformance, however, is weak, as it can only be detected, if the *Narrow* definition is used and only for the pooled OLS specification. Hence, this is only partially in line with other findings in the literature confirming an operating outperformance of family firms (Barontini & Caprio, 2006; Miller et al., 2007; Villalonga & Amit, 2006). As these papers do not distinguish between normal and crisis times, it could well be that to some extent the outperformance detected there picks up crisis outperformance.

All control variables seem to have a significant influence when using the pooled OLS regression. However, in the system GMM estimation only shareholder concentration and total assets are left as control variables with a significant positive impact on ROA. This is in line with findings of Demsetz and Lehn (1985) who suggest that an increased shareholder concentration goes along with an increased incentive for the shareholder to monitor the investment. Neither the seemingly significant impact

[5] For the sake of brevity, these additional analyses are not reported.

Table 4 Regression of return on assets on family firm characteristics

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Return on assets			Return on assets		
	Pooled OLS			System GMM		
Basic	0.001			−0.021		
	(0.008)			(0.029)		
Basic × Crisis	0.031***			0.133***		
	(0.011)			(0.030)		
Narrow		0.032***			0.014	
		(0.010)			(0.034)	
Narrow × Crisis		0.038***			0.272***	
		(0.012)			(0.064)	
Founder-led			0.033**			0.051
			(0.014)			(0.046)
Founder-led × Crisis			0.050***			0.224***
			(0.015)			(0.072)
Shareholder concentration	0.054***	0.053***	0.052***	0.055***	0.061***	0.053***
	(0.013)	(0.012)	(0.012)	(0.021)	(0.022)	(0.020)
Num. management board	−0.006**	−0.007***	−0.006**	0.012	0.012	0.012
	(0.002)	(0.002)	(0.002)	(0.011)	(0.011)	(0.010)
Num. supervisory board	−0.003***	−0.003***	−0.003***	−0.003	−0.002	−0.002
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)
Total assets	0.026***	0.026***	0.026***	0.047***	0.047***	0.048***
	(0.003)	(0.003)	(0.003)	(0.009)	(0.008)	(0.009)
Age since incorporation	0.022***	0.022***	0.023***	0.004	0.004	0.006
	(0.004)	(0.004)	(0.004)	(0.007)	(0.008)	(0.007)
Debt ratio	−0.009*	−0.008*	−0.008*	−0.008	−0.008	−0.008
	(0.005)	(0.005)	(0.004)	(0.006)	(0.006)	(0.006)
Beta	−0.023***	−0.024***	−0.023***	0.002	−0.000	0.002
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)
Constant	−0.312***	−0.350***	−0.313***	−0.397**	−0.352*	−0.470***
	(0.043)	(0.043)	(0.040)	(0.190)	(0.199)	(0.165)
Observations	6568	6568	6568	4658	4658	4658
Adjusted R^2	0.168	0.175	0.173			
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	0	0	0	3	3	3
Diff-in-Hansen test of exogen. (*p*-value)				0.822	0.945	0.930
Hansen test of overident. (*p*-value)				0.171	0.179	0.156
AR (1) test (*p*-value)				6.47e-07	7.17e-08	9.67e-08
AR (2) test (*p*-value)				0.227	0.0705	0.0535

Table 4 (continued)

Regressions of return on assets on different family firm dummy variables. The observation period is from 1998–2018. In the two-step system GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 486. Robust standard errors are clustered on the company level and reported in parentheses. In the GMM regressions, the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

of the size of the management or supervisory board, nor the age of the company, nor the debt ratio, nor the beta survive the endogeneity correction introduced by the system GMM estimation.

It should be noted that in the GMM specification, the null hypothesis of no second-order serial correlation (AR2) in the differenced residuals cannot be rejected, at least not at a 5% level. Also, the Hansen test of overidentification cannot reject the null hypothesis of having valid instruments. And, finally, the Hansen test of exogeneity does not reject the null hypothesis of all instruments being exogenous. Overall, this gives us confidence in not using a miss-specified GMM model.

For Tobin's *Q* (Table 5) results are similar, although less clear. While in the panel OLS specification we do not find any crisis outperformance in terms of valuation relative to non-family firms, such outperformance is detected in the system GMM estimation. At least, this is true, if the *Basic* or *Narrow* definition is used. This finding is in contrast to Lins et al. (2013). According to our evidence, it can be presumed that the market recognizes the positive impact of founder CEOs on firm performance during times of crisis leading to a higher valuation of these firms during such a period. Regarding the overall outperformance of family firms, the picture further corroborates that there seems to be no outperformance outside crisis periods. In fact, only when using the system GMM a general outperformance can be detected for *Founder-led* family firms.

Altogether, our results are in line with hypothesis H1a. Moreover, to some extent, they also confirm H1b. At least, we see that crisis resilience seems to be stronger for companies with family ownership in the *Narrow* sense. However, when looking at the *Founder-led* definition, the hypothesis that stronger family involvement leads to better crisis performance cannot be confirmed.

To gather additional insights regarding hypothesis H1b we run an additional analysis, where family involvement is split into its three components, i.e., equity ownership, management board, or supervisory board involvement. In Table 6 we present the results of a regression where we interact dummies representing these three different involvement components with the crisis dummy.

Results in Table 6 indicate that the crisis outperformance of family firms relative to their non-family counterpart is mostly driven by equity ownership. In fact, the interaction coefficient is significantly positive in 3 out of 4 regressions in this case. As opposed

Table 5 Regression of Tobin's *Q* on family firm characteristics

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Tobin's *Q*			Tobin's *Q*		
	Pooled OLS			System GMM		
Basic	0.106			0.035		
	(0.072)			(0.157)		
Basic × Crisis	−0.000			0.384*		
	(0.066)			(0.208)		
Narrow		0.124			0.130	
		(0.090)			(0.179)	
Narrow × Crisis		0.126			0.645**	
		(0.089)			(0.273)	
Founder-led			0.271**			0.577**
			(0.126)			(0.250)
Founder-led × Crisis			0.120			0.392
			(0.131)			(0.312)
Shareholder concentration	0.409***	0.382***	0.374***	0.252**	0.245**	0.211*
	(0.116)	(0.110)	(0.110)	(0.103)	(0.102)	(0.110)
Num. management board	0.046**	0.047**	0.047**	0.028	0.026	0.018
	(0.020)	(0.020)	(0.020)	(0.050)	(0.050)	(0.048)
Num. supervisory board	0.010	0.011	0.011	0.062***	0.066***	0.073***
	(0.009)	(0.009)	(0.009)	(0.016)	(0.016)	(0.017)
Total assets	−0.045**	−0.046**	−0.045**	−0.096**	−0.104***	−0.106***
	(0.022)	(0.022)	(0.021)	(0.040)	(0.040)	(0.040)
Age since incorporation	−0.026	−0.030	−0.024	−0.018	−0.021	−0.016
	(0.028)	(0.027)	(0.027)	(0.028)	(0.027)	(0.029)
Debt ratio	−0.049**	−0.048**	−0.047**	−0.026	−0.023	−0.019
	(0.023)	(0.023)	(0.023)	(0.016)	(0.015)	(0.015)
Beta	0.116***	0.116***	0.116***	−0.006	−0.010	−0.012
	(0.035)	(0.035)	(0.034)	(0.028)	(0.027)	(0.028)
Constant	2.117***	2.105***	2.210***	1.001	1.150	1.688*
	(0.373)	(0.381)	(0.327)	(0.874)	(0.915)	(0.886)
Observations	5962	5962	5962	5485	5485	5485
Adjusted R^2	0.146	0.147	0.152			
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	0	0	0	1	1	1
Diff-in-Hansen test of exogen. (*p*-value)				0.915	0.782	0.896
Hansen test of overident. (*p*-value)				0.217	0.227	0.159
AR (1) test (*p*-value)				9.14e-11	0	5.87e-11
AR (2) test (*p*-value)				0.921	0.981	0.852

Table 5 (continued)

Regressions of return on assets on different family firm dummy variables. The observation period is from 1998–2018. In the two-step system GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 536. Robust standard errors are clustered on the company level and reported in parentheses. In the GMM regressions, the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

to that we do not find a significantly positive effect of supervisory board involvement in any case, while for management board involvement we only find weak evidence in the case where ROA is used as the dependent variable. Overall, these results suggest that crisis outperformance is a family ownership rather than a family management effect. This would be in line with the presumption that families act as block-holders with a long-term commitment giving the company more credibility on the market.

It should be noted that we use the *Basic* definition dummy as the baseline case in Table 6. In this way, results can be directly compared to the regressions in Tables 4 and 5. The results, therefore, deliver insights into how family firm behavior in times of crisis differs depending on whether the family is involved via ownership, or management or supervisory board membership. However, the reader might also be interested in seeing how these three different means of family involvement affect crisis behavior within each group. Therefore, we present an alternative specification of Table 6 in Table 10 in the Appendix, where the baseline case is split up into the three different forms of family involvement. Cum grano salis it can be said that results are quite similar.

Of course, it is an interesting question how this credibility on the market can be specifically used to dampen the crisis impact. As we analyze the Global Financial Crisis here, a natural question will be whether crisis resilience might be driven by leverage reduction. Especially in the case of the German setting with a protracted banking crisis first caused by the Global Financial Crisis and then followed by a sovereign debt crisis of other Euro member states, the influence of firm debt could be pivotal. In Table 7 we show the influence of family firms on leverage during the crisis.

Surprisingly, family firms were able to reduce leverage during crisis times compared to their non-family counterparts. This holds for all family firm definitions and—almost—regardless of the estimation approach. There is one exception: for *Founder-led* family firms we do not find a significant negative coefficient in the case of the system GMM estimation. Thus, our results are in line with hypothesis H2a stating that family firms decrease their leverage during times of crisis more than their non-family counterparts.

It should be noted in Table 7 that in the system GMM the null hypothesis of no first-order serial correlation (AR1) in the differenced residuals cannot be rejected. All other test statistics, i.e. the test on second-order serial correlation (AR2) and both Hansen-tests work fine. Together with the fact that the pooled OLS generates

Table 6 Regression of performance variables on founding family involvement

Dependent variable	(1)	(2)	(3)	(4)
	Return on assets		Tobin's Q	
	Pooled OLS	System GMM	Pooled OLS	System GMM
Basic	0.000	−0.026	0.101	−0.032
	(0.008)	(0.029)	(0.070)	(0.082)
Eq × Crisis	0.055***	0.260***	0.258**	0.306
	(0.014)	(0.077)	(0.117)	(0.209)
MB × Crisis	0.009	0.083*	−0.099	−0.184
	(0.015)	(0.048)	(0.104)	(0.158)
SB × Crisis	−0.001	−0.075	−0.117	0.172
	(0.014)	(0.066)	(0.091)	(0.227)
Constant	−0.313***	−0.328	2.117***	1.197
	(0.043)	(0.210)	(0.373)	(0.977)
Observations	6568	4658	5962	4261
Adjusted R^2	0.170		0.147	
Control variables	All	All	All	All
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Lags in the dependent variable	0	3	0	3
Diff-in-Hansen test of exogen. (p-value)		0.957		0.425
Hansen test of overident. (p-value)		0.217		0.340
AR (1) test (p-value)		6.55e-08		2.09e-06
AR (2) test (p-value)		0.104		0.386

Regressions of return on assets on different family firm dummy variables. The observation period is from 1998–2018. In the two-step system GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. We us the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 486 (ROA) or 536 (Tobin's Q). Robust standard errors are clustered on the company level and reported in parentheses. In the GMM regressions, the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

similar results,[6] we are confident that our results are not misleading. Nevertheless, due to this issue the interpretation of the results should be taken with care.

Next, we investigate how family firms were able to relatively reduce their leverage during the crisis. As we do not find evidence that family firms were able to tap other financing sources than the banking sector during the crisis, an underlying reason

[6] This would still be the case, if we added the same two lags to the dependent variable as in the GMM.

Table 7 Regression of the company's debt ratio on family firm characteristics

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Debt ratio			Debt ratio		
	Pooled OLS			System GMM		
Basic	−0.035			−0.126		
	(0.044)			(0.244)		
Basic × Crisis	−0.175*			−0.450**		
	(0.098)			(0.197)		
Narrow		−0.053			−0.773*	
		(0.034)			(0.464)	
Narrow × Crisis		−0.165**			−0.667***	
		(0.068)			(0.250)	
Founder-led			−0.086**			−1.375
			(0.043)			(0.944)
Founder-led × Crisis			−0.209***			−0.448
			(0.079)			(0.451)
Constant	−0.670***	−0.660***	−0.730***	−1.484	−1.050	−2.082
	(0.242)	(0.206)	(0.210)	(1.920)	(1.300)	(2.033)
Observations	6640	6640	6640	5295	5295	5295
Adjusted R^2	0.068	0.067	0.068			
Control variables	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	0	0	0	2	2	2
Diff-in-Hansen test of exogen. (*p*-value)				0.298	0.592	0.0870
Hansen test of overident. (*p*-value)				0.268	0.367	0.124
AR (1) test (*p*-value)				0.277	0.270	0.270
AR (2) test (*p*-value)				0.600	0.510	0.516

Regressions of debt ratio on different family firm dummy variables. The observation period is from 1998–2018. Control variables are the same as for the main regressions in Tables 4 and 5, excluding the debt ratio. For clarity, coefficients are not reported. In the two-step system GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 439. Robust standard errors are clustered on the company level and reported in parentheses. In the GMM regressions, the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 8 Regression of payout ratio and retained earnings on family firm characteristics

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Payout ratio			Retained earnings		
	System GMM			System GMM		
Basic	−2.697			0.397**		
	(1.848)			(0.170)		
Basic × Crisis	3.038			0.205		
	(2.215)			(0.204)		
Narrow		−1.384			0.439**	
		(2.497)			(0.175)	
Narrow × Crisis		1.848			0.499**	
		(2.338)			(0.244)	
Founder-led			−1.713			0.665**
			(1.802)			(0.262)
Founder-led × Crisis			2.371			0.304
			(2.094)			(0.296)
Constant	9.522	8.898	8.880	−1.000	−0.975	−0.962
	(10.298)	(11.644)	(9.559)	(1.089)	(0.909)	(1.005)
Observations	5612	5612	5612	3345	3345	3345
Control variables	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	1	1	1	2	2	2
Diff-in-Hansen test of exogen. (*p*-value)	0.0432	0.0432	0.0174	0.833	0.965	0.888
Hansen test of overident. (*p*-value)	0.569	0.359	0.701	0.169	0.274	0.236
AR (1) test (*p*-value)	0.117	0.116	0.116	5.62e−04	9.04e−05	2.34e−4
AR (2) test (*p*-value)	0.571	0.567	0.572	0.618	0.741	0.705

Two-step system GMM regression of payout ratio and retained earnings on different family firm dummy variables. The observation period is from 1998–2018. Control variables are the same as for the main regressions in Tables 4 and 5. For clarity, coefficients are not reported. In the GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 423 (Payout ratio) or 403 (retained earnings). Robust standard errors are reported in parentheses and the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

could be a better preparation for a crisis due to a more sustainable business strategy. This could be visible through a generally lower payout ratio as well as higher retained earnings, which puts the firms in a position to use more internal funds in crisis times. Table 8 shows the regression results for retained earnings and payout ratio. For *retained earnings*, we see generally positive and significant coefficients. This indicates that there was a trend inducing family firms to increase their retained earnings more than their non-family counterparts outside crisis periods. Related to this we do not find higher payout ratios outside the crisis period.

However, the evidence in favor of hypothesis H2b is rather weak. We only find retained earnings to be significantly higher during times of crisis in family firms in one out of three cases, and for the payout ratio we do not find any evidence at all.

Hence, we can conclude that crisis outperformance was not driven by a different or even more restrictive payout policy during the crisis. Given that in Table 7, we have found family firm debt ratios to relatively decrease during the crisis, this could lead to the presumption that family firms reacted with investment cuts to master the challenges of the crisis. This would be in line with Lins et al. (2013).

Interestingly, we do not find any evidence in favor of this investment reduction hypothesis. Specifically, we measure investments through capital expenditures as well as the level of employment. Table 9 shows the results for the system GMM regression using them as dependent variables.

The results, again, are rather weak. But if ever, they point in the opposite direction. In fact, at least for the *Narrow* family firm definition, the crisis interaction coefficients are positive, indicating that in this case family firms have increased their *capital expenditures* as well as their *employment* relative to their non-family counterparts. This evidence can be regarded as being weakly supportive of hypothesis H2c.

It should be noted here that in the system GMM with Capex as dependent variable the null hypothesis of no second-order serial correlation (AR2) in the differenced residuals is rejected. All other test statistics, i.e. the test on first-order serial correlation (AR2) and both Hansen-tests work fine. In unreported results we have run a pooled OLS regression coming up with similar results. Hence, even though results should be interpreted with care, we are confident that they are not misleading.

4.2 Robustness checks and alternative explanations

We chose a crisis period from 2008 to 2010, taking into account the sovereign debt crisis following directly after the financial crisis. Yet, others (Lins et al., 2013) only regarded the 2008–2009 time frame as crisis specific. At the same time, it can also be argued that Europe had a great recession period going from 2008 to 2012 as only by that year the European sovereign debt crisis calmed. Thus, we control for year sensitivity and alternatively run regressions with the 2008–2009 timeframe as well as 2008–2012. Results are shown in Table 11 in the Appendix for pooled OLS-regressions only. It can be seen that the crisis outperformance of family firms over all three definitions remains robust for ROA, while for Tobin's *Q* results remain weak.

We also check for the potential impact of outliers by re-running models (1)–(3) in Tables 4 and 5 as quantile regressions with bootstrapped standard errors. Again, we show the results in the Appendix in Table 12. Results remain qualitatively unchanged with respect to the return on assets variable. However, when using Tobin's *Q* as dependent variable, significance levels for the family firm variables fall

Table 9 Regression of capex and employment on family firm characteristics

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Capex			Employment		
	System GMM			System GMM		
Basic	0.235			0.193**		
	(0.228)			(0.090)		
Basic × Crisis	0.230			0.249		
	(0.260)			(0.167)		
Narrow		0.291			−0.011	
		(0.237)			(0.106)	
Narrow × Crisis		0.659*			0.376**	
		(0.357)			(0.181)	
Founder-led			0.543			−0.245
			(0.331)			(0.159)
Founder-led × Crisis			0.682			0.327*
			(0.433)			(0.187)
Constant	−5.735***	−6.576***	−5.874***	−2.675***	−3.201***	−2.995***
	(1.391)	(1.001)	(1.686)	(0.658)	(0.652)	(0.587)
Observations	4448	4448	4448	6068	6068	6068
Control variables	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	3	3	3	1	1	1
Diff-in-Hansen test of exogen. (*p*-value)	0.986	0.986	0.992	0.639	0.639	0.778
Hansen test of overident. (*p*-value)	0.249	0.271	0.216	0.205	0.155	0.250
AR (1) test (*p*-value)	5.51e-10	5.54e-10	6.60e-10	7.05e-06	3.60e-06	4.68e-06

Table 9 (continued)

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Capex			Employment		
	System GMM			System GMM		
AR (2) test (*p*-value)	1.05e-04	1.73e-04	1.59e-04	0.0837	0.0644	0.0696

Two-step system GMM regression of capex and employment on different family firm dummy variables. The observation period is from 1998–2018. Control variables are the same as for the main regressions in Tables 4 and 5. For clarity, coefficients are not reported. In the GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (= 5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 487 (Capex) or 537 (Employment). Robust standard errors are reported in parentheses and the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous. Robust standard errors in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

below the usual thresholds. Taking into account that we have winsorized our data in the first place, this probably comes not as a surprise.

Also, it could be argued that a broader approach to performance measures should be used. In fact, besides profits and valuations, it is also often argued that sales could be used as a performance measure (cf. e.g., Aghion et al., 2021). Therefore, we re-run the two-step system GMM regression in Table 4 by using the logarithm of sales as dependent variable. Results are shown in Table 13 in the Appendix. Again, our hypothesis that family firms outperform in times of crisis is corroborated.

All our regressions show that shareholder concentration is one additional key predictor of advantages in agency costs and, therefore, firm performance. As Overland et al. (2020) noted, there are various approaches for computing shareholder concentration. In our main regressions, we have chosen a standard Herfindahl–Hirschman concentration measure. However, results seem to be robust against alternative concentration measures. In fact, by using the cumulated ownership ratio of the top three shareholders as an alternative control variable, we get pretty similar results in economic and statistical terms. Detailed results are presented in Table 13 in the Appendix. This is important as our standard measure for shareholder concentration has a potential drawback in terms of data availability. Actually, shareholdings only need to be reported above a 3% level for listed German companies.

4.3 Limitations

The key limitation of this paper is due to endogeneity and simultaneity problems. For that reason, we have employed a dynamic panel system GMM. Even though we are confident to come up with robust results based on consistent and unbiased estimations, there might be reasons to interpret the results with care. For instance, it could well be that the family firm characteristic-performance relationship can also be explained by non-performing firms becoming non-family firms over their lifetime due to underperformance. In the case of persistent negative performance, the family could be forced to sell the business. This would lead to nonperforming firms systematically transferring out of the family firm sample into the non-family sample. It is unclear, whether we would be able to entirely capture this effect via the dynamic panel regression approach.

However, over our entire observation period, 53 family firms become non-family firms which represents 0.6% of the firm-year observations. The impact within our observation period is therefore assumed to be minor.

Another omitted variable bias might be caused by the way we measure family influence. This paper focuses on the direct influence the family can exercise on the company based on formalized mechanisms. Astrachan et al. (2002) propose a more refined measure by introducing the F-PEC scale of family influence. This scale is composed of three subscales, power, experience, and culture. Experience and culture are implicitly regarded in this paper under the broader term family goals. However, we do not explicitly test for them but only measure power with its components ownership, governance, and management.

5 Conclusion

This paper makes two key contributions. First, it extends existing research on family firm performance of German listed companies over a relatively long-time span of 21 years. We show that family firms do not outperform their non-family counterparts in general, but significantly do so during times of crisis. This result is fairly robust for operating performance (ROA), but to a lesser extent for Tobin's *Q*. Moreover, this crisis resilience is more pronounced the stronger the family influence in terms of equity ownership.

Second, we present evidence supporting the notion that crisis resilience is related to more financial flexibility and long-term decision-making. In fact, we see that family firms are able to decrease their leverage during the crisis. However, this is not at the expense of future cash flows as we present some evidence supporting the presumption that family firms increase their capital expenditures and employment during times of crisis relative to their non-family counterparts. This is mainly supported for the *Narrow* family firm definition. Given that these results also hold in a dynamic panel system GMM approach, we hope to add new evidence on the drivers of family firm performance.

For policymakers and management, our study hints at the importance of family influence in times of crises. Especially the notion of ongoing capital expenditures and held-up employment rates seems of interest to both, management and policymakers alike. Seeing that the economic world is led into a more volatile setting, finding evidence for the importance of ongoing investments is a significant insight for decision-makers on corporate and political sides. Meanwhile, our findings suggest that family ownership might improve the stability and resilience of the corporate landscape.

Our study focuses on a country-based setting, namely Germany as a bank-based economy with a two-tier board system. The differences to prior findings indicate that management and policymakers always have to take into account country specific details. This is most likely again one of the reasons for different outcomes in family-firm research, as institutional settings are quite different and must therefore take the distinct characteristics into account.

An interesting effect found in our study is the influence of family ownership rather than family management. If we assume this to be based mainly on the stability and reliability of long-term block-holders, the question arises of how this effect could be transferred onto non-family firms. This could be an interesting aspect, alongside the question of upheld financial flexibility and leverage reduction.

As the differentiated view on family firm definitions and family influence on the firm also shows, policymakers should not be led to jump to quick conclusions in supporting certain ownership structures over others. By adding to the ongoing discussion of who performs better and why—family or non-family firms—we can show again that there is no easy answer and that we need to dig deeper into the topic to fully uncover the different influences. This must be left to future research.

Appendix

See Tables 10, 11, 12, and 13.

Table 10 Alternative regression of performance variables on founding family involvement

Dependent variable	(1)	(2)	(3)	(4)
	Return on assets		Tobin's *Q*	
	Pooled OLS	System GMM	Pooled OLS	System GMM
Eq	0.030***	0.029	0.043	−0.120
	(0.011)	(0.038)	(0.092)	(0.119)
MB	−0.020*	−0.092**	0.055	−0.007
	(0.011)	(0.040)	(0.094)	(0.114)
SB	0.003	0.081*	0.098	0.020
	(0.010)	(0.042)	(0.074)	(0.130)
Eq × Crisis	0.027*	0.254***	0.246***	0.402
	(0.014)	(0.075)	(0.091)	(0.252)
MB × Crisis	0.027*	0.127**	−0.092	−0.209
	(0.016)	(0.049)	(0.074)	(0.163)
SB × Crisis	−0.003	−0.165**	−0.153*	0.122
	(0.014)	(0.078)	(0.087)	(0.230)
Constant	−0.322***	−0.494**	2.097***	0.929
	(0.043)	(0.225)	(0.375)	(0.992)
Observations	6568	4658	5962	4261
Adjusted R^2	0.173		0.148	
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Lags in the dependent variable	0	3	0	3
Diff-in-Hansen test of exogen. (*p*-value)		0.912		0.249
Hansen test of overident. (*p*-value)		0.317		0.322
AR (1) test (*p*-value)		2.72e-08		2.22e-06
AR (2) test (*p*-value)		0.0767		0.373

Regressions of return on assets on different family firm dummy variables. The observation period is from 1998–2018. In the two-step system GMM model, the reported number of lags in the dependent variable is included without showing the coefficients. Estimations are run with the Stata xtabond2-command. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 486 (ROA) or 536 (Tobin's *Q*). Robust standard errors are clustered on the company level and reported in parentheses. In the GMM regressions, the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 11 Regression of performance variables during alternative crisis periods

Dependent variable	Crisis = 2008/09						Crisis = 2008/12					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Return on assets			Tobin's Q			Return on assets			Tobin's Q		
	Pooled OLS			Pooled OLS			Pooled OLS			Pooled OLS		
Basic	0.003			0.112			−0.003			0.104		
	(0.008)			(0.071)			(0.008)			(0.073)		
Basic × Crisis	0.022*			−0.049			0.032***			0.008		
	(0.013)			(0.064)			(0.010)			(0.068)		
Narrow		0.034***			0.141			0.030***			0.105	
		(0.009)			(0.091)			(0.010)			(0.089)	
Narrow × Crisis		0.041***			0.019			0.032***			0.158	
		(0.013)			(0.081)			(0.012)			(0.098)	
Founder-led			0.036***			0.296**			0.030**			0.226*
			(0.013)			(0.126)			(0.015)			(0.127)
Founder-led × Crisis			0.049***			−0.038			0.042***			0.232
			(0.016)			(0.123)			(0.016)			(0.158)
Constant	−0.313***	−0.349***	−0.314***	2.113***	2.102***	2.203***	−0.311***	−0.352***	−0.312***	2.118***	2.101***	2.226***
	(0.043)	(0.043)	(0.040)	(0.373)	(0.381)	(0.327)	(0.043)	(0.043)	(0.040)	(0.374)	(0.380)	(0.324)
Observations	6568	6568	6568	5962	5962	5962	6568	6568	6568	5,962	5,962	5,962
Adjusted R^2	0.167	0.175	0.172	0.146	0.147	0.152	0.168	0.175	0.173	0.146	0.148	0.153
Control variables	All	All	All	All	All	All	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Pooled OLS-regressions of performance variables on different family firm dummy variables. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. The observation period is from 1998–2018. Robust standard errors are clustered on the company level and reported in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 12 Bootstrapped quantile regressions

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Return on assets			Tobin's *Q*		
Basic	0.007**			0.029		
	(0.003)			(0.019)		
Basic × Crisis	0.009*			−0.042		
	(0.005)			(0.034)		
Narrow		0.016***			0.006	
		(0.003)			(0.022)	
Narrow × Crisis		0.012*			0.031	
		(0.006)			(0.047)	
Founder-led			0.012**			0.065
			(0.005)			(0.051)
Founder-led × Crisis			0.021**			−0.002
			(0.009)			(0.131)
Constant	−0.021	−0.039***	−0.012	1.866***	1.896***	1.901***
	(0.014)	(0.014)	(0.014)	(0.127)	(0.146)	(0.141)
Observations	6568	6568	6568	5962	5962	5962
Pseudo R-squared	0.0477	0.0503	0.0483	0.0836	0.0834	0.0836
Control variables	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Bootstrapped quantile regressions of performance variables on different family firm dummy variables. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. The observation period is from 1998–2018. Regressions are performed using the Stata command *bsqreg* with 250 bootstrap replications and 100 WLS iterations

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 13 Regressions using alternative performance or shareholder concentration variables

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Return on assets			Sales		
	System GMM			System GMM		
Basic	−0.035			−0.138		
	(0.029)			(0.119)		
Basic × Crisis	0.103***			0.201*		
	(0.030)			(0.105)		
Narrow		−0.010			−0.182	
		(0.034)			(0.117)	
Narrow × Crisis		0.213***			0.346**	
		(0.051)			(0.155)	
Founder-led			0.026			−0.585***
			(0.043)			(0.207)
Founder-led × Crisis			0.180***			0.711***
			(0.060)			(0.184)
Shareholder concentration				−0.092	−0.077	−0.097
				(0.067)	(0.074)	(0.086)
Shareholder concentration (Top 3)	0.044**	0.047**	0.042**			
	(0.020)	(0.021)	(0.021)			
Constant	−0.430**	−0.446***	−0.485***	0.931	0.834	−0.018
	(0.179)	(0.172)	(0.178)	(0.838)	(0.820)	(0.865)
Observations	4,724	4,724	4,724	5,423	5,423	6,145
Control variables	All	All	All	All	All	All
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Lags in the dependent variable	3	3	3	2	2	1
Diff-in-Hansen test of exogen. (*p*-value)	0.966	0.996	0.999	0.938	0.974	0.906
Hansen test of overident. (*p*-value)	0.119	0.172	0.135	0.183	0.302	0.0575
AR (1) test (*p*-value)	7.12e-07	1.70e-07	1.34e-07	1.14e-04	9.10e-05	9.34e-06
AR (2) test (*p*-value)	0.241	0.112	0.0967	0.112	0.121	0.646

Two-step system GMM regression of return on assets and sales on different family firm dummy variables. The observation period is from 1998–2018. For clarity, coefficients are not reported. Industry fixed effects are based on the first two digits of the Standard Industry Classification code. Estimations are run with the Stata xtabond2-command. We use the same control variables as in Tables 4 and 5, but do not report their coefficients. A full table is available upon request. All control variables except *Num. management board* and *Num. supervisory board* are used as instruments (=5) in the level and the first-difference equation with up to two lags, with year- and industry-fixed effects being strictly exogenous. The total number of instruments is 486 (ROA) or 512 (Sales). Robust standard errors are reported in parentheses and the (Windmeijer 2005) correction is applied. AR (1) and AR (2) are tests for first- and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments are exogenous

***$p<0.01$, **$p<0.05$, *$p<0.1$

Acknowledgements We thank the "Stiftung Familienunternehmen" who financially supported a wider project on listed family firms in Germany that largely added to the database used for this research.

Funding Open Access funding enabled and organized by Projekt DEAL.

Data availability Not applicable.

Declarations

Conflict of interest None to declare.

References

Aghion, P., Bloom, N., Lucking, B., Sadun, R., & Reenen, J. (2021). Turbulence, firm decentralization, and growth in bad times. *American Economic Journal: Applied Economics, 13*(1), 133–169. https://doi.org/10.1257/app.20180752

Allouche, J., Amann, B., Jaussaud, J., & Kurashina, T. (2008). The impact of family control on the performance and financial characteristics of family versus nonfamily businesses in Japan: A matched-pair investigation. *Family Business Review, 21*, 315–329. https://doi.org/10.1177/08944865080210040104

Amann, B., & Jaussaud, J. (2012). Family and non-family business resilience in an economic downturn. *Asia Pacific Business Review, 18*(2), 203–223. https://doi.org/10.1080/13602381.2010.537057

Amit, R., & Villalonga, B. (2014). Financial performance of family firms. In L. Melin, M. Nordqvist, & P. Sharma (Eds.), *The SAGE handbook of family business* (pp. 157–178). SAGE.

Amore, M. D., Pelucco, V., & Quarato, F. (2022). Family ownership during the covid-19 pandemic. *Journal of Banking & Finance, 135*, 106385. https://doi.org/10.1016/j.jbankfin.2021.106385

Ampenberger, M., Schmid, T., Achleitner, A.-K., & Kaserer, C. (2013). Capital structure decisions in family firms: Empirical evidence from a bank-based economy. *Review of Managerial Science, 7*(3), 247–275. https://doi.org/10.1007/s11846-011-0077-2

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial Economics, 68*(2), 263–285. https://doi.org/10.1016/S0304-405X(03)00067-9

Anderson, R. C., & Reeb, D. M. (2003a). Founding-family ownership and firm performance: Evidence from the S&P 500. *The Journal of Finance, 58*(3), 1301–1328. https://doi.org/10.1111/1540-6261.00567

Anderson, R. C., & Reeb, D. M. (2003b). Founding-family ownership, corporate diversification, and firm leverage. *The Journal of Law and Economics, 46*(2), 653–684. https://doi.org/10.1086/377115

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *The Journal of Financial and Quantitative Analysis, 43*(1), 59–92. https://doi.org/10.1017/S0022109000002751

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies, 58*(2), 277–297.

Arrondo-García, R., Fernández-Méndez, C., & Menéndez-Requejo, S. (2016). The growth and performance of family businesses during the global financial crisis: The role of the generation in control. *Journal of Family Business Strategy, 7*(4), 227–237. https://doi.org/10.1016/j.jfbs.2016.11.003

Astrachan, J. H., Klein, S. B., & Smyrnios, K. X. (2002). The F-PEC scale of family influence: A proposal for solving the family business definition problem. *Family Business Review, 15*(1), 45–58. https://doi.org/10.1111/j.1741-6248.2002.00045.x

Attig, N., Boubakri, N., El Ghoul, S., & Guedhami, O. (2016). The global financial crisis, family control, and dividend policy. *Financial Management, 45*(2), 291–313. https://doi.org/10.1111/fima.12115

Azila-Gbettor, E. M., Honyenuga, B. Q., Berent-Braun, M. M., & Kil, A. (2018). Structural aspects of corporate governance and family firm performance: A systematic review. *Journal of Family Business Management, 8*(3), 306–330. https://doi.org/10.1108/JFBM-12-2017-0045

Baek, J.-S., Kang, J.-K., & Suh Park, K. (2004). Corporate governance and firm value: Evidence from the Korean financial crisis. *Journal of Financial Economics, 71*(2), 265–313. https://doi.org/10.1016/S0304-405X(03)00167-3

Barontini, R., & Caprio, L. (2006). The effect of family control on firm value and performance: Evidence from continental Europe. *European Financial Management, 12*(5), 689–723. https://doi.org/10.1111/j.1468-036X.2006.00273.x

Basco, R., Campopiano, G., Calabrò, A., & Kraus, S. (2019). They are not all the same! Investigating the effect of executive versus non-executive family board members on firm performance. *Journal of Small Business Management, 57*(S2), 637–657. https://doi.org/10.1111/jsbm.12535

Bauweraerts, J. (2013). How do private family firms face the crisis? Empirical evidence from Belgium. *International Business Research*. https://doi.org/10.5539/ibr.v6n8p91

Bennedsen, M., Nielsen, K. M., Perez-Gonzalez, F., & Wolfenzon, D. (2007). Inside the family firm: The role of families in succession decisions and performance. *The Quarterly Journal of Economics, 122*(2), 647–691. https://doi.org/10.1162/qjec.122.2.647

Bertrand, M., & Schoar, A. (2006). The role of family in family firms. *Journal of Economic Perspectives, 20*(2), 73–96. https://doi.org/10.1257/jep.20.2.73

Block, J. H. (2012). R&D investments in family and founder firms: An agency perspective. *Journal of Business Venturing, 27*(2), 248–265. https://doi.org/10.1016/j.jbusvent.2010.09.003

Burkart, M., Panunzi, F., & Shleifer, A. (2003). Family firms. *The Journal of Finance, 58*(5), 2167–2201. https://doi.org/10.1111/1540-6261.00601

Campello, M., Graham, J. R., & Harvey, C. R. (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics, 97*(3), 470–487. https://doi.org/10.1016/j.jfineco.2010.02.009

Chua, J. H., Chrisman, J. J., Steier, L. P., & Rau, S. B. (2012). Sources of heterogeneity in family firms: An introduction. *Entrepreneurship Theory and Practice, 36*(6), 1103–1113. https://doi.org/10.1111/j.1540-6520.2012.00540.x

Cucculelli, M., & Bettinelli, C. (2016). Corporate governance in family firms, learning and reaction to recession: Evidence from Italy. *Futures, 75*, 92–103. https://doi.org/10.1016/j.futures.2015.10.011

D'Aurizio, L., Oliviero, T., & Romano, L. (2015). Family firms, soft information and bank lending in a financial crisis. *Journal of Corporate Finance, 33*, 279–292. https://doi.org/10.1016/j.jcorpfin.2015.01.002

de Massis, A., Kotlar, J., Campopiano, G., & Cassia, L. (2015). The impact of family involvement on SMEs' performance: Theory and evidence. *Journal of Small Business Management, 53*(4), 924–948. https://doi.org/10.1111/jsbm.12093

de Miguel, A., Pindado, J., & de la Torre, C. (2004). Ownership structure and firm value: New evidence from Spain. *Strategic Management Journal, 25*(12), 1199–1207. https://doi.org/10.1002/smj.430

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy, 93*, 1155–1177. https://doi.org/10.1086/261354

Ding, W., Levine, R., Lin, C., & Xie, W. (2021). Corporate immunity to the COVID-19 pandemic. *Journal of Financial Economics, 141*(2), 802–830. https://doi.org/10.1016/j.jfineco.2021.03.005

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics, 65*(3), 365–395. https://doi.org/10.1016/S0304-405X(02)00146-0

Faccio, M., Marchica, M.-T., & Mura, R. (2011). Large shareholder diversification and corporate risk-taking. *Review of Financial Studies, 24*(11), 3601–3641. https://doi.org/10.1093/rfs/hhr065

Fauver, L., & Fuerst, M. E. (2006). Does good corporate governance include employee representation? Evidence from German corporate boards. *Journal of Financial Economics, 82*(3), 673–710. https://doi.org/10.1016/j.jfineco.2005.10.005

Fohlin, C. (2007). The history of corporate ownership and control in Germany. In R. K. A. Morck (Ed.), *A history of corporate governance around the world* (pp. 223–281). The University of Chicago Press.

Gómez-Mejia, L. R., Chirico, F., Martin, G., & Baù, M. (2021). Best among the worst or worst among the best? Socioemotional wealth and risk-performance returns for family and non-family firms under financial distress. *Entrepreneurship Theory and Practice*. https://doi.org/10.1177/10422587211057420

Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly, 52*(1), 106–137. https://doi.org/10.2189/asqu.52.1.106

González, M., Guzmán, A., Pombo, C., & Trujillo, M.-A. (2013). Family firms and debt: Risk aversion versus risk of losing control. *Journal of Business Research, 66*(11), 2308–2320. https://doi.org/10.1016/j.jbusres.2012.03.014

Gugler, K. (2003). Corporate governance, dividend payout policy, and the interrelation between dividends, R&D, and capital investment. *Journal of Banking & Finance, 27*(7), 1297–1321. https://doi.org/10.1016/S0378-4266(02)00258-3

Hansen, C., & Block, J. (2020). Exploring the relation between family involvement and firms' financial performance: A replication and extension meta-analysis. *Journal of Business Venturing Insights, 13*, e00158. https://doi.org/10.1016/j.jbvi.2020.e00158

Hansen, C., Block, J., & Neuenkirch, M. (2020). Family firm performance over the business cycle: A meta-analysis. *Journal of Economic Surveys, 34*(3), 476–511. https://doi.org/10.1111/joes.12364

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica, 50*(4), 1029–1054.

Isakov, D., & Weisskopf, J.-P. (2015). Pay-out policies in founding family firms. *Journal of Corporate Finance, 33*, 330–344. https://doi.org/10.1016/j.jcorpfin.2015.01.003

Johnson, S., Boone, P., Breach, A., & Friedman, E. (2000). Corporate governance in the Asian financial crisis. *Journal of Financial Economics, 58*(1–2), 141–186. https://doi.org/10.1016/S0304-405X(00)00069-6

Kappes, I., & Schmid, T. (2013). The effect of family governance on corporate time horizons. *Corporate Governance: An International Review, 21*(6), 547–566. https://doi.org/10.1111/corg.12040

Kraus, S., Clauss, T., Breier, M., Gast, J., Zardini, A., & Tiberius, V. (2020). The economics of COVID-19: Initial empirical evidence on how family firms in five European countries cope with the corona crisis. *International Journal of Entrepreneurial Behavior & Research, 26*(5), 1067–1092.

La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance, 54*(2), 471–517. https://doi.org/10.1111/0022-1082.00115

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (2000). Agency problems and dividend policies around the world. *The Journal of Finance, 55*(1), 1–33. https://doi.org/10.1111/0022-1082.00199

Lahouel, B. B., Gaies, B., Zaied, Y. B., & Jahmane, A. (2019). Accounting for endogeneity and the dynamics of corporate social-corporate financial performance relationship. *Journal of Cleaner Production, 230*, 352–364. https://doi.org/10.1016/j.jclepro.2019.04.377

Lemmon, M. L., & Lins, K. V. (2003). Ownership structure, corporate governance, and firm value: Evidence from the East Asian financial crisis. *The Journal of Finance, 58*(4), 1445–1468. https://doi.org/10.1111/1540-6261.00573

Lins, K. V., Volpin, P., & Wagner, H. F. (2013). Does family control matter? International evidence from the 2008–2009 financial crisis. *Review of Financial Studies, 26*(10), 2583–2619. https://doi.org/10.1093/rfs/hht044

Lohwasser, T. S., Hoch, F., & Kellermanns, F. W. (2022). Strength in stability: A meta-analysis of family firm performance moderated by institutional stability and regime type. *Entrepreneurship Theory and Practice, 46*(1), 117–158. https://doi.org/10.1177/10422587211026863

Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of Corporate Finance, 12*(2), 321–341. https://doi.org/10.1016/j.jcorpfin.2005.02.002

McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal, 21*(5), 603–609. https://doi.org/10.1002/(SICI)1097-0266(200005)21:5%3c603::AID-SMJ101%3e3.0.CO;2-3

Miller, D., Le Breton-Miller, I., Lester, R. H., & Cannella, A. A. (2007). Are family firms really superior performers? *Journal of Corporate Finance, 13*(5), 829–858. https://doi.org/10.1016/j.jcorpfin.2007.03.004

Minichilli, A., Brogi, M., & Calabrò, A. (2016). Weathering the storm: Family ownership, governance, and performance through the financial and economic crisis. *Corporate Governance: An International Review, 24*(6), 552–568. https://doi.org/10.1111/corg.12125

Mitton, T. (2002). A cross-firm analysis of the impact of corporate governance on the East Asian financial crisis. *Journal of Financial Economics, 64*(2), 215–241. https://doi.org/10.1016/S0304-405X(02)00076-4

Mueller, H. M., & Philippon, T. (2011). Family firms and labor relations. *American Economic Journal: Macroeconomics, 3*(2), 218–245. https://doi.org/10.1257/mac.3.2.218

O'Boyle, E. H., Pollack, J. M., & Rutherford, M. W. (2012). Exploring the relation between family involvement and firms' financial performance: A meta-analysis of main and moderator effects. *Journal of Business Venturing, 27*(1), 1–18. https://doi.org/10.1016/j.jbusvent.2011.09.002

Overland, C., Mavruk, T., & Sjörgen, S. (2020). Keeping it real or keeping it simple? Ownership concentration measures compared. *European Financial Management, 26*(4), 958–1005. https://doi.org/10.1111/eufm.12249

Patel, P. C., & Chrisman, J. J. (2014). Risk abatement as a strategy for R&D investments in family firms. *Strategic Management Journal, 35*(4), 617–627. https://doi.org/10.1002/smj.2119

Pérez-González, F. (2006). Inherited control and firm performance. *American Economic Review, 96*(5), 1559–1588. https://doi.org/10.1257/aer.96.5.1559

Pindado, J., Requejo, I., & Torre, C. (2012). Do family firms use dividend policy as a governance mechanism? Evidence from the Euro zone. *Corporate Governance: An International Review, 20*(5), 413–431. https://doi.org/10.1111/j.1467-8683.2012.00921.x

Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance. *Handbook of the economics of finance 2 (Part A)* (pp. 493–572). Elsevier.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal, 9*(1), 86–136. https://doi.org/10.1177/1536867x0900900106

Sardo, F., Vieira, E. S., & Serrasqueiro, Z. (2021). The role of gender and succession on the debt adjustments of family firm capital structure. *Eurasian Business Review*. https://doi.org/10.1007/s40821-021-00186-w

Schmid, T. (2013). Control considerations, creditor monitoring, and the capital structure of family firms. *Journal of Banking & Finance, 37*(2), 257–272. https://doi.org/10.1016/j.jbankfin.2012.08.026

Schmid, T., Achleitner, A.-K., Ampenberger, M., & Kaserer, C. (2014). Family firms and R&D behavior—New evidence from a large-scale survey. *Research Policy, 43*(1), 233–244. https://doi.org/10.1016/j.respol.2013.08.006

Schmid, T., Ampenberger, M., Kaserer, C., & Achleitner, A.-K. (2010). Controlling shareholders and payout policy: Do founding families have a special 'taste for dividends'? *CEFS Working Paper Series* (01-2010)

Schmid, T., Ampenberger, M., Kaserer, C., & Achleitner, A.-K. (2015). Family firm heterogeneity and corporate policy: Evidence from diversification decisions. *Corporate Governance: An International Review, 23*(3), 285–302. https://doi.org/10.1111/corg.12091

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of Political Economy, 94*(3), 461–488.

Škare, M., & Porada-Rochoń, M. (2021). Measuring the impact of financial cycles on family firms: How to prepare for crisis? *International Entrepreneurship and Management Journal, 17*, 1111–1130. https://doi.org/10.1007/s11365-020-00722-6

Stacchini, M., & Degasperi, P. (2015). Trust, family businesses and financial intermediation. *Journal of Corporate Finance, 33*, 293–316. https://doi.org/10.1016/j.jcorpfin.2015.01.006

Taras, V., Memili, E., Wang, Z., & Harms, H. (2018). Family involvement in publicly traded firms and firm performance: A meta-analysis. *Management Research Review, 41*(2), 225–251. https://doi.org/10.1108/MRR-05-2017-0150

Theissen, E. (2004). Organized equity markets. In J. Krahnen & R. Schmidt (Eds.), *The German financial system.* Oxford University Press.

van Essen, M., Carney, M., Gedajlovic, E. R., & Heugens, P. P. M. A. R. (2015a). How does family control influence firm strategy and performance? A meta-analysis of US publicly listed firms. *Corporate Governance: An International Review, 23*(1), 3–24. https://doi.org/10.1111/corg.12080 van Essen, M., Strike, V. M., Carney, M., & Sapp, S. (2015b). The resilient family firm: Stakeholder outcomes and institutional effects. *Corporate Governance: An International Review, 23*(3), 167–183. https://doi.org/10.1111/corg.12087

Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics, 80*(2), 385–417. https://doi.org/10.1016/j.jfineco.2004.12.005

Villalonga, B., & Amit, R. (2009). How are US family firms controlled? *Review of Financial Studies, 22*(8), 3047–3091. https://doi.org/10.1093/rfs/hhn080

Villalonga, B., Amit, R., Trujillo, M.-A., & Guzmán, A. (2015). Governance of family firms. *Annual Review of Financial Economics, 7*, 635–654. https://doi.org/10.1146/annurev-financial-110613-034357

Visintin, F., Pittino, D., & Minichilli, A. (2017). Financial performance and non-family CEO turnover in private family firms under different conditions of ownership and governance. *Corporate Governance: An International Review, 25*(5), 312–337. https://doi.org/10.1111/corg.12201

Wagner, D., Block, J. H., Miller, D., Schwens, C., & Xi, G. (2015). A meta-analysis of the financial performance of family firms: Another attempt. *Journal of Family Business Strategy, 6*(1), 3–13. https://doi.org/10.1016/j.jfbs.2015.01.001

Wenger, E., & Kaserer, C. (1998). The German system of corporate governance: A model which should not be imitated. In S. W. Black & M. Moersch (Eds.), *Competition and convergence in financial markets: The German and Anglo-American models* (pp. 41–78). Elsevier.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient tow-step GMM estimators. *Journal of Econometrics, 126*(1), 25–51. https://doi.org/10.1016/J.JECONOM.2004.02.005

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics, 105*(3), 581–606. https://doi.org/10.1016/j.jfineco.2012.03.005

Zhou, H., He, F., & Wang, Y. (2017). Did family firms perform better during the financial crisis? New insights from the S&P 500 firms. *Global Finance Journal, 33*, 88–103. https://doi.org/10.1016/j.gfj.2017.01.001