# SUNSHINE AFTER THE RAIN? THE STOCK MARKET PERFORMANCE OF FAMILY FIRMS IN AND AFTER FINANCIAL CRISES

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## Abstract

This study applies financial crises as an exogenous shock to family and non-family firms to identify differences in stock market performance. We investigate 278 firms listed on the German Stock Exchange in the world financial crisis starting in 2007 as well as the Euro crisis starting in 2010. Based on the methodology of Gompers, Ishii, and Metrick (2003), we form portfolios with and without family blockholders and apply equally- as well as value-weighted four-factor models to identify differences in stock market performance. Results show that family firms do not necessarily perform better than non-family firms in years of economic downturn. But our models suggest that they outperform non-family firms three years after the beginning of the world financial crisis and in and after the Euro crisis. This implies that family firms recover faster than their non-family counterparts. We follow that the financial preconditions of family firms, differing financial strategies during recessions and the controlling incentives and capacities that are rooted in the long-term orientation and risk aversion of family blockholders, as well as the country-specific corporate governance framework of Germany, explain these differences. The paper contributes to the ongoing academic exploration on family firm performance as well as crisis resilience of family firms and suggests practical implications for policymakers in countries with high levels of family ownership among firms.

**Keywords:** Family Firms, Family Ownership, Financial Crisis, Abnormal Returns, Stock Market Performance, Blockholders

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## 1. INTRODUCTION

Firms controlled by families are the most common firm-type in Continental Europe (Faccio & Lang, 2002; Barontini & Caprio, 2006). Due to less shareholder protection, the ownership structures of German firms are rather concentrated (Becht & Boehmer, 2003). Family firms are the backbone of the German economy (Gottschalk, Lubczyk, Hauer, & Keese, 2019) and represent a significant share of the firms listed on the national stock market (Achleitner et al., 2019). With regards to the two-tier corporate governance system in place, family shareholders are often present in the legal bodies of the firm to increase their influence and controlling abilities that would be otherwise limited primarily to

the annual general meeting (Franzoi, Mietzner, & Thelemann, 2021).

The question of superior or inferior corporate performance is of great economic relevance in countries like Germany — besides a year-long academic discussion. Without final consensus, recent studies mostly find a better operative performance in case of family firms (Wagner, Block, Miller, Schwens, & Guoqian, 2015; Hansen & Block, 2020), which also holds for Germany (Andres, 2008; Achleitner et al., 2019). While corporate finance suggests family firms could afford to profit from higher debt via leverage effect, they exhibit lower debt levels than non-family firms in Germany (Schmid, 2013). Among control considerations, this supports assumptions of higher risk aversion of family firms in literature (Mishra & McConaughy, 1999; Ampenberger, Schmid, Achleitner, & Kaserer, 2013).

We suggest that the combination of strong operative performance and low leverage may be beneficial particularly in times of economic crises. Family firms, for example, might afford to hold on to well-trained employees during recessions and benefit after economic recovery. If this is the case and family firms profit from their economic preconditions and corporate actions in/after crises, we suggest employing historical economic crises to test this assumption. We presume that capital markets anticipate such advantages and expect that family firms may recover faster in capital market performance than non-family firms. Before the recent impact of the COVID-19 pandemic on the economy, European economies have experienced two crises — the world financial crisis and the subsequent Euro crisis. These events may serve as exogenous shocks to the liquidity, sales, supply chains and general financial and market performance of family firms (Lins, Volpin, & Wagner, 2013; Minichilli, Brogi, & Calabrò, 2016; Aldamen, Duncan, Kelly, & McNamara, 2020).

Regarding market performance, most studies unveil a higher stock market performance of family firms in Europe (Sraer & Thesmar, 2007; Cella, 2009; Eugster & Isakov, 2019). In Germany, family firms perform at least as good (Corstjens, Peyer, & Van der Heyden, 2006) or better than non-family firms (Cella, 2009). Nevertheless, market performance studies often cover phases of economic expansion when performance differences among firms may be masked by the general expansion of economies and record heights in stock performance[1]. Another concern with studies on firm performance is that variations in the financial behavior between family and non-family firms (e.g., such as financing policies) are unlikely to be exogenous questioning causality on firm performance and valuation (Lins et al., 2013)[2]. The few publications already investigating time frames of economic recession, find mixed evidence (Lins et al., 2013) or superior market performance of family firms (Amann & Jaussaud, 2012; Lipiec, 2014; Amore, Quarato, & Pelucco, 2021).

Using the same dataset as in this analysis, Franzoi and Mietzner (2021) show that family firms record positive abnormal returns compared to non-family firms due to the corporate governance involvement of family blockholders. While their publication includes some years of recession, it does not focus on the crisis behavior of family firms at all. We argue that specifically in financial crises we can expect performance differences among family and non-family firms in Germany, as their behavior and economic preferences were shown to differ as well. Regarding the mentioned hold-on to firm-specific human capital during the crisis, studies, for example, show that family firms indeed lay-off employees later during crises (Sraer & Thesmar, 2007; Mietzner & Tyrell, 2012). Utilization of federal short-term working programs supplement this notion: "We want to keep our well-trained people on board", the CEO of the large German machine manufacturer TRUMPF noted — know-how and personnel-capacity are regarded as key components in post-crises competitiveness and long-term success (Washington, 2010). Due to lower leverage, family firms have additional buffer to absorb financial crisis, afford crisis strategies beyond short-term measures and potentially profit from a better starting position in times of economic recovery. As family wealth is often largely concentrated in the company (Anderson, Mansi, & Reeb, 2003), financial crises endanger both the family and the firm. Hence, in addition to the perceived differences in operative performance during recessions, family blockholders are highly incentivized for and committed to the long-term survival of the firm which may furthermore function as a positive signal to the market (Amore et al., 2021).

We apply the two mentioned economic crises as natural experiments (Sun et al., 2019) and study performance differences from the perspective of an investor applying an investment strategy long in family firms and short in non-family firms right before the world financial crisis hit stock markets in Germany in 2007. We apply four-factor models to identify return differences between family portfolios and non-family portfolios in five-year windows from 2007 (world financial crisis) and 2010 (Euro crisis). Despite the largely differing operative performance, regression results reveal that the stock market returns are higher for family firms than for non-family firms after the third year of the crises for the latest. We find family firms to earn an annualized excess return compared to non-family firms between 7.95–10.68% (world financial crisis) and 7.92–13.59% (Euro crisis). Additional long-term estimations show that the outperformance lasts over a ten-year period up to 2017 (excess return of 5.36%).

We follow that family firms profit from their economic preconditions (e.g., lower leverage ratios), their long-term orientation and their monitoring incentives as well as perceived market reactions. Our results contribute to the ongoing exploration of scholars investigating the link between family influence in the firm and performance by showing that phases of the economic crisis may be differentiated from general time series estimations when investigating firm performance. Based on the findings, we discuss contributions for academia and implications for policymakers in Continental

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[1] Managerial skills (Sun, Lee, & Phan, 2019) and good governance (van Essen, Engelen, & Carney, 2013) may be more crucial in economic recessions that in times when general market growth may cover firm-specific weaknesses in governance.
[2] Giroud, Mueller, Stomper, and Westerkamp (2012) argue similarly in investigating the debt overhang and performance of Austrian ski hotels.

European countries with high levels of family ownership.

The remainder of this paper is organized as follows. Section 2 discusses literature and develops a hypothesis and Section 3 explains the empirical method. Subsequently, Section 4 presents the results that are discussed in Section 5, before Section 6 concludes.

## 2. LITERATURE REVIEW AND HYPOTHESIS

### 2.1. Family firm performance

Given the worldwide spread and presence of family-owned firms (La Porta, Lopez-de-Silanes, & Shleifer, 1999; Faccio & Lang, 2002), scholars are increasingly exploring the influence of the presence of this ownership type on the financial behavior and corporate performance since the turn of the millennium. In pioneering publications, Anderson and Reeb (2003), Villalonga and Amit (2006), Barontini and Caprio (2006) and others started a year-long debate on performance differences, suggesting that family firms were at least as good or better in their corporate performance than non-family firms. The latest meta-studies on the operative performance of family firms either find no significant difference (O'Boyle, Pollack, & Rutherford, 2012) or a rather weak, but the superior performance of family firms, though depending on the assessment of family control as well as the observed performance-measure (Wagner et al., 2015; Taras, Memili, Wang, & Harms, 2018; Gonzalez, Idrobo, & Taborda, 2019; Hansen & Block, 2020).

Regarding market-based performance measures, most publications find family firms to outperform non-family firms (Taras et al., 2018). Specifically, on European stock market returns, Miralles-Marcelo, Miralles-Quirós, and Lisboa (2014) show that family firms perform as least as good as non-family firms in Portugal and Spain, while Sraer and Thesmar (2007) and Eugster and Isakov (2019) find a better performance of family firms in France and Switzerland. Regarding the German stock market, Corstjens et al. (2006) exhibit no difference in stock market returns, while Cella (2009) and the study similar to our's by Franzoi and Mietzner (2021) document a superior market performance for family firms.

Recent publications started putting a focus on performance differences during times of economic recession, however with mixed evidence (Calabrò, Frank, Minichilli, & Suess-Reyes, 2021). Minichilli et al. (2016) and Zhou, He, and Wang (2017) both find a higher operative performance for family firms during the world financial crisis (return on assets (ROA) or return on equity (ROE)). Regarding market performance, Lins et al. (2013) show in a cross-country analysis, that in cutting investments during times of crises, families are ready to accept an underperformance compared to the market to retain control of the family firm (no significant performance difference found for developed countries). Despite this publication, there are only a few more publications on the stock market performance of family firms specifically during financial crises. Lipiec (2014) discovers an outperformance of family firms in the construction sector on the Polish stock market and Amann and Jaussaud (2012) find a greater resilience for family firms during the Asian crisis of 1997. In a current working paper, Amore et al. (2021) show that family firms perform better than non-family firms on the Italian stock market during the recent COVID-19 recession. The only long-term study specifically on Germany by Franzoi and Mietzner (2021) that documents positive abnormal returns for family firms also includes years of recession in its panel. But the fact that their publication does not discuss operating performance or focus on financial crises at all, connected with the evidence from other publications that document a structurally different financial behavior of family firms in general and in recession phases in particular reinforces the need for a specific study for Germany.

### 2.2. Family control, financial preconditions and corporate crisis behavior

The determinants of market performance during recessions may be varied and are rooted in the different financial behavior of family firms in economic crises. Though they do not find significant results for developed countries, Lins et al. (2013) argue that the discovered overall underperformance of family firms in the world financial crisis can be traced back to investment cuts[3] to preserve family funds as well as firms with higher agency problems with minority shareholders. Regarding operating expenditures, by contrast, Sun et al. (2019) show that family firms invest more in research and development during recessions than non-family, if they are not financially constrained. Yet an additional factor for a market discount may be that family firms differ in their stakeholder management (Zellweger & Nason, 2008) as they, for example, are more restrained to layoff employees during economic shocks and more credible in their commitment towards their workforce (Sraer & Thesmar, 2007; Mueller & Philippon, 2011). Mietzner and Tyrell (2012) confirm this finding for Germany and show that family firms at the same time bear an increased risk valuation (higher beta) by the market.

While these aspects may cause discounts in market valuation, they may be reasonable strategies for families and their firms, for example. Not cutting R&D expenses or carrying unemployed human capital through economic recessions, for example, may increase the probability of long-term success[4]. Financial crises touch the core of the prosperity of family blockholders. As a large part of the family wealth is often tied up in the firm (Anderson et al., 2003), the family is suspect to increased risk during a financial crisis and as family firms tend to be less diversified, they may be susceptible to additional risk. Family firms are commonly perceived as having a longer investment horizon (Anderson & Reeb, 2003; Gómez-Mejía, Haynes, Nuñez-Nickel, Jacobson, & Moyano-Fuentes, 2007). As the natural interest of family firm owners is the desire to pass on

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[3] Investments are assessed via capital expenditure (CAPEX)/total assets.
[4] Various German family firms, for example, are located in non-metropolitan areas, employing highly skilled personnel (e.g., mechanical engineers) that is difficult to attract. Full personnel capacity in phases of economic recovery may be a significant competitive advantage compared to firms who must hire formerly laid-off staff.

the business to the subsequent generation (Arrondo-García, Fernández-Méndez, & Menéndez-Requejo, 2016), families have a high incentive for monitoring (Demsetz & Lehn, 1985) and good governance in crises. Furthermore, corporate governance profits from the involvement of family blockholders (Franzoi & Mietzner, 2021) and the commitment of these shareholders may function as a positive signal to the market and external stakeholders (Amore et al., 2021).

In the German largely bank-financed economy (Gorton & Schmid, 2000; Breig & Elsas, 2009) family firms are found to be significantly less leveraged than non-family firms due to control considerations and/or risk aversion (Schmid, 2013; Ampenberger et al., 2013). A higher equity ratio may serve as a buffer in times of financial distress. With a lower leverage ratio in family firms, strategies of not extensively cutting R&D expenses or keeping employees in phases of general economic crises might be more realistic with regards to headroom in debt covenants. In addition, family firms in Europe have higher cash holdings than non-family firms (Durán, Lonzano, & Yaman, 2016; Caprio, Del Guidice, & Signori, 2020). Following these remarks, we hypothesize for Germany that though family firms may suffer from worse market performance compared to non-family firms in the immediate impact of financial crises, family firms may exhibit a superior stock market performance in the aftermath due to their monitoring incentives, lower leverage, countercyclical personnel-policies, and long-term survival strategies aligned with aspired financial health (Aldamen et al., 2020).

## 3. METHODOLOGY

### 3.1. Sample and period under review

We use the same dataset as Franzoi and Mietzner (2021) and investigate 278 firms listed on the Germany Stock Exchange (CDAX) at the year-end of 2006, the year before the world financial crisis hit stock exchanges worldwide. The ownership structure of these firms is hand-picked by investigating annual reports, company websites and Bureau van Dijk's Dafne database and identify every ownership stake larger than 5%. Firms are classified as family held when a voting block larger than 25% is held by a family. The definition refers to the blocking minority prescribed by German Stock Corporation Law as a shareholder (i.e., a family) with a voting share larger than 25% can block important strategic decisions by the general meeting of the company (such as mergers or the dismissal of supervisory board members). This definition is in line with various other studies on the financial behavior of listed family firms in Germany (Franks, Mayer, Volpin, & Wagner, 2012; Ampenberger et al., 2013).

Data on the daily four-factors for Germany were retrieved from Richard Stehle's website[5] and on the daily three-factors for Europe from Kenneth R. French's website[6]. Daily returns and yearly financial

data of the listed firms were obtained from Thomson Datastream.

The year 2007 marks the beginning of the first phase of the impact of the world financial crisis on the European economy (Swiss National Bank, 2008; German Council of Economic Experts, 2011) and the start of our first five-year observation period. The starting year is in line with various other publications on the world financial crisis (Fahlenbrach & Stulz, 2011; van Essen et al., 2013; van Essen, Strike, Carney, & Sapp, 2015; Amato, Basco, Ansón, & Lattanzi, 2020). The second five-year observation period on the Euro crisis starts in 2010 with the outbreak of the European debt crisis, the bailouts of Greece, Portugal and Ireland as well as the establishment of the Financial Stability Facility (EFSF) (Copelovitch, Frieden, & Walter, 2016).

### 3.2. Research design

We employ a multivariate estimation method to assess the impact of family ownership on stock market returns during the two financial crises. We apply a method prominently introduced by Gompers, Ishii, and Metrick (2003) and subsequently used by different authors on estimating stock returns of different groups distinguished primarily through corporate governance or ownership means (Cella, 2009; Eugster & Isakov, 2019; Franzoi & Mietzner, 2021) as well used for estimating asset prices during crisis periods (Lins et al., 2013).

All firms of the sample identified as family-held per year-end 2006 and all non-family firms are grouped into two different portfolios. We subsequently calculate the daily buy-and-hold returns of the family and non-family portfolios in the respective time periods by dividing the index value of stock *i* at the end of each trading day *t* by the index value of the previous trading day before subtracting 1.

$$BHR = \left[ \prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100 \qquad (1)$$

We then apply the four-factor model by Carhart (1997) that has been tested for the German market by Hanauer, Kaserer, and Rapp (2013) and is presented in equation (2):

$$R_{pt} = \alpha_p + \beta_{1p}RMRF_t + \beta_{2p}SMB_t + \beta_{3p}HML_t + \beta_{4p}WML_t + \varepsilon_{pt} \qquad (2)$$

where $R_{pt}$ denotes the excess return of the portfolio over the risk-free rate or the excess return of the family portfolio over the non-family portfolio at time $t$, $RMRF_t$ is the market excess return over the risk-free rate, $SMB_t$ and $HML_t$ denote the zero investment benchmark factors for size and market-to-book value according to Fama and French (1993) and $WML_t$ captures prior performance of winners-minus-losers. $\alpha_p$ captures the excess return over a passive investment into the factors with regards to the portfolios.

An alternative method to access the influence of family blockholders on stock market returns would be the estimation of a firm characteristics approach analogous to Gompers et al. (2003) and von Lilienfeld-Toal and Ruenzi (2014) that includes

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monthly Fama and MacBeth (1973) regressions as well as pooled panel regressions (with two-way-clustered standard errors over time and firms in the sample). Eugster and Iskakov (2019) apply a similar approach. Yet firstly, this approach is less efficient in Germany because, in contrast to the US (Gompers et al., 2003), significantly fewer companies are listed. Secondly, the chosen calculation of buy-and-hold returns and estimation of four-factor models also allows accessing the performance difference specifically between portfolios of family firms and non-family firms in time periods of economic crises.

## 4. RESULTS

### 4.1. Operative performance and buy-and-hold returns

Table 1 presents the summary statistics on the operative performance. Family firms are significantly smaller than non-family firms by total assets,

revenue, and the number of employees. Unlike suggested by the literature, family firms do not hold more cash, but as their current ratio is higher, they have more resources on balance to meet short-term obligations. Accounting performance is superior in family firms, as their median in ROA and ROE ranges between 0.9–1.0% above the non-family portfolio (confirming findings of Minichilli et al., 2016, and Zhou et al., 2017, for crisis periods). In terms of market valuation, firms in the family portfolio are valued with a lower market-to-book ratio. As described by Ampenberger et al. (2013) and Schmid (2013), family firms exhibit a more conservative financing structure as their median equity ratio is about 7.6% higher. Over the period under review, non-family firms invested less in CAPEX, but spend more in OPEX (operating expenditure) by R&D expenses than family businesses. While ownership is far more concentrated, as more than 56% of the shares are closely held, family firms also pay higher dividends per share than non-family firms.

**Table 1.** Operating performance

| | Non-family | | | Family (ownership) | | | Difference | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | N | Mean | Median | N | Mean | p | Median | z |
| Total assets (in mln) | 9,956.7 | 288.7 | 770 | 3,154.0 | 177.9 | 837 | -6,802.7 | *** | -110.8 | *** |
| Revenue (in mln) | 8,095.5 | 335.3 | 764 | 2,486.5 | 215.9 | 836 | -5,609.0 | *** | -119.4 | *** |
| Cash (in % total assets) | 12.72 | 9.28 | 693 | 12.58 | 9.12 | 699 | -0.13 | | -0.17 | |
| Current ratio | 1.99 | 1.54 | 769 | 2.07 | 1.76 | 823 | 0.08 | | 0.22 | *** |
| Return on assets (in %) | 2.22 | 4.44 | 769 | 4.79 | 5.37 | 834 | 2.57 | *** | 0.93 | *** |
| Return on equity (in %) | 48.38 | 9.61 | 748 | 4.56 | 10.62 | 829 | -43.82 | | 1.01 | *** |
| Price/earnings ratio | 35.62 | 16.4 | 635 | 26.35 | 15.80 | 757 | -9.27 | | -0.60 | |
| Market-to-book ratio | 2.43 | 1.67 | 903 | 1.90 | 1.57 | 939 | -0.52 | *** | -0.10 | *** |
| Equity ratio | 40.36 | 38.68 | 770 | 46.32 | 46.24 | 837 | 5.96 | *** | 7.56 | *** |
| CAPEX (in % net property plant and equipment (PPE)) | 32.00 | 20.64 | 746 | 36.71 | 23.13 | 824 | 4.71 | * | 2.49 | ** |
| R&D (in % revenue) | 6.86 | 3.46 | 462 | 6.16 | 2.50 | 388 | -0.70 | | -0.95 | ** |
| Dividend/share | 39.98 | 36.35 | 384 | 42.91 | 38.91 | 531 | 2.93 | ** | 2.56 | * |
| Dividend yield | 2.98 | 2.44 | 519 | 3.12 | 2.56 | 597 | 0.13 | | 0.12 | |
| Closely held shares (in %) | 38.18 | 30.76 | 593 | 55.83 | 56.05 | 638 | 17.65 | *** | 25.30 | *** |
| No. of employees | 41,810 | 5,644 | 549 | 11,899 | 1,458 | 571 | -29,912 | *** | -4,186 | *** |

*Notes: This table reports the mean and median of selective financial characteristics of firms in the portfolios with no-family ownership and > 25% family ownership as well as the results of the test statistics on the means (ttest) and medians (Wilcoxon rank test) of the firms in the non-family vs. family portfolio. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.*

Figure 1 and Figure 2 plot the cumulated mean and median buy-and-hold returns of the family- and non-family portfolios less the risk-free rate in both crisis periods. During the world financial crisis (Figure 1) family firms mostly underperformed non-family firms up to mid-2010. Further on, both mean and median buy-and-hold returns range above those of non-family firms. In the second observation period covering the Euro crisis (Figure 2), the family firm portfolio records buy-and-hold returns

constantly above the respective returns of non-family firms (both mean and median). A comparison of buy-and-hold returns based on value-weighted portfolios reveals similar results (not reported, figures available upon request). Correspondingly, summary statistics on individual portfolio returns shows higher overall mean and median returns for the family firm portfolio in the two observation periods (Appendix, Table A.1).

**Figure 1.** Buy and hold returns world financial crisis (2007–2011)
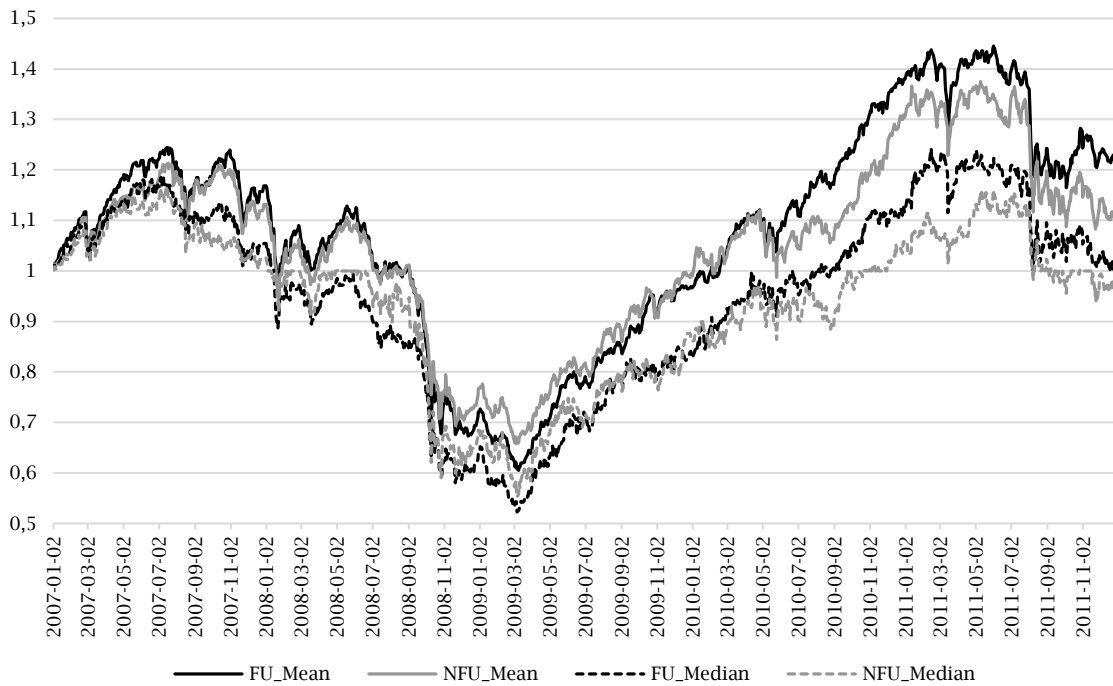


*Notes: World financial crisis (start January 2007) family vs. non-family firm BHR equally-weighted (> 25% family ownership at Janury 1, 2007)*

**Figure 2.** Buy-and-hold returns Euro crisis (2010–2014)
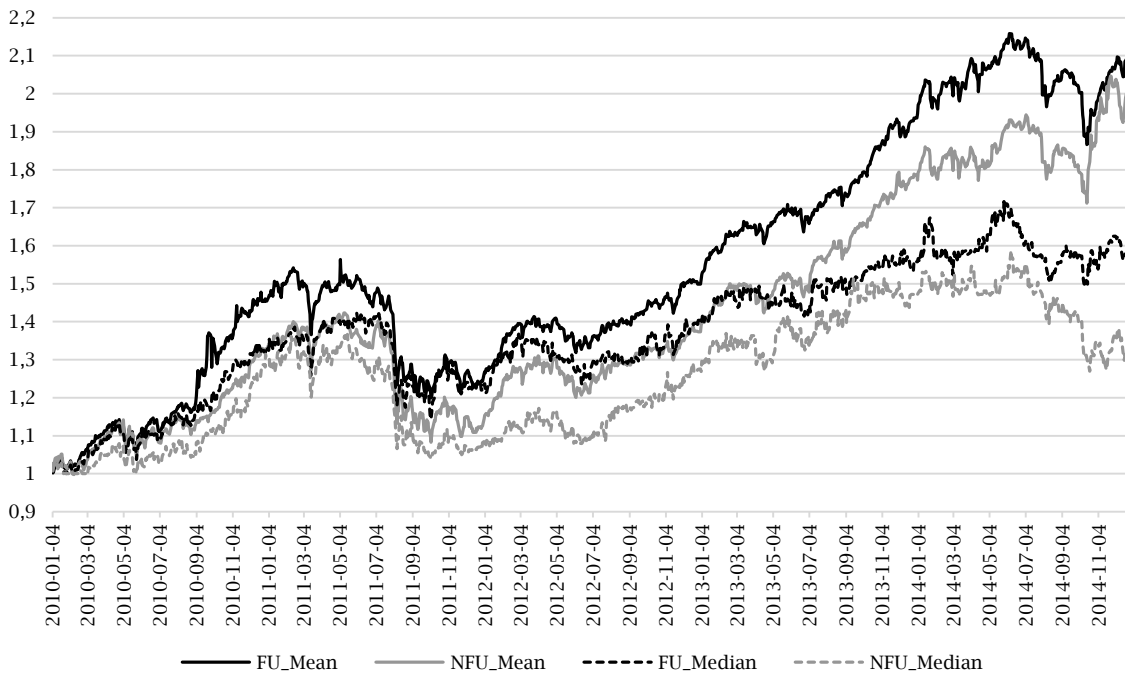


*Notes: Euro crisis (start January 2010) family vs. non-family firm BHR equally-weighted (> 25% family ownership at January 1, 2007)*

## 4.2. Regression results

Table 2 reports the results of the four-factor regression models on the world financial crisis in year-by-year expanding time frames from 2007 to 2008–2011 (equally-weighted). Columns 1–2 and 4–5 of the results report the portfolio excess returns of the two portfolios. Both portfolios individually record a negative significant return during all time windows of the crisis. Columns 3 and 6 report the excess returns on a strategy long in family firms vs. short in non-family firms. Excess returns are generally positively driven by the size and negatively driven by momentum. We do not find a significant

abnormal return for family firms in the two most severe years of the financial crisis. By contrast, the four-factor models reveal a significant excess return for family firms after the third year of the beginning of the financial crisis. Family firms outperform non-family firms by an annualized percentage between 7.95% (2007–2010) and 10.69% (2007–2011) (calculated by average trading days per time window).

Table 3 exhibits the regression results for the Euro crisis analogous to the previous table. Unlike in case of the first two years of the world financial crisis, the strategy long in the portfolio with family firms and short in the portfolio with non-family firms constantly reveals positive, significant alphas. These results suggest a five-year steady excess return of family firms over non-family firms. The excess return decreases over time and varies from 13.59% (2010–2011, annualized) to 7.92% (2010–2014, annualized).

As the regression models on Euro crisis reveal a decrease in the excess returns of family firms between 2010–2014 (compared to non-family firms), we estimate an additional long-term model covering a time frame of ten years since the outbreak of the world financial crisis. Results reveal, that

a strategy long in the family firm portfolio and short in the non-family portfolio still records an annualized excess return of 5.36% (as data on the four-factors for Germany are only available up to 2016 by Prof. Richard Stehle, we applied a three-factor model with factors retrieved from the website of Prof. Kenneth R. French; the application of a three-factor model is also sufficient as publications on the German stock market have shown (Dirkx & Peter, 2020)) (reported in Appendix, Table A.2).

As suggested by a comparison of the buy-and-hold returns of the two portfolios, the four-factor regression models confirm, that family firms did not reveal a significant difference in their stock market performance during the first phase of the financial crisis up to 2009. This finding largely corroborates findings by Lins et al. (2013) who were unable to identify find significant stock market performance differences between family and non-family firms in developed countries from 2008–2009. Nevertheless, the estimations reveal that since 2010 family firms record a significant excess return compared to non-family firms and keep up their outperformance during the Euro crisis.

**Table 2.** World financial crisis 2007–2011: Four-factor model (equally-weighted portfolios)

| | Non-family-risk-free | Family-risk-free | Family-non-family | Non-family-risk-free | Family-risk-free | Family-non-family |
|---|---|---|---|---|---|---|
| | *2007–2008* | | | *2007–2009* | | |
| Alpha | -0.0156*** | -0.0153*** | 0.0003 | -0.0114*** | -0.0112*** | 0.0002 |
| | (-33.15) | (-31.56) | (1.14) | (-29.09) | (-27.64) | (1.11) |
| Rm-Rf | 0.009*** | 0.0091*** | 0.0000 | 0.01*** | 0.0097*** | -0.0003 |
| | (17.06) | (16.58) | (0.18) | (20.76) | (19.45) | (-1.38) |
| SMB | 0.0051*** | 0.0071*** | 0.002*** | 0.0064*** | 0.008*** | 0.0016*** |
| | (7.21) | (9.74) | (6.08) | (10.36) | (12.54) | (5.52) |
| HML | 0.0007 | 0.001 | 0.0003 | 0.0023*** | 0.0023*** | 0.0000 |
| | (0.8) | (1.13) | (0.77) | (3.71) | (3.65) | (0.13) |
| WML | -0.0018*** | -0.0021*** | -0.0003* | -0.002*** | -0.0022*** | -0.0002* |
| | (-5.42) | (-6.13) | (-1.94) | (-6.82) | (-7.44) | (-1.84) |
| N | 506 | 506 | 506 | 760 | 760 | 760 |
| R² | 54.73% | 50.02% | 17.79% | 53.08% | 46.76% | 16.92% |
| Adj. R² | 54.37% | 49.63% | 17.13% | 52.84% | 46.48% | 16.48% |
| | *2007–2010* | | | *2007–2011* | | |
| Alpha | -0.009*** | -0.0086*** | 0.0004** | -0.008*** | -0.0077*** | 0.0003** |
| | (-27.39) | (-24.87) | (2.21) | (-29.23) | (-26.64) | (2.28) |
| Rm-Rf | 0.0103*** | 0.01*** | -0.0003 | 0.0103*** | 0.01*** | -0.0003 |
| | (24.69) | (22.62) | (-1.56) | (29.49) | (27.29) | (-1.47) |
| SMB | 0.0066*** | 0.0081*** | 0.0015*** | 0.0064*** | 0.0081*** | 0.0017*** |
| | (11.98) | (13.99) | (5.58) | (13.98) | (16.73) | (6.86) |
| HML | 0.0027*** | 0.0027*** | 0.0000 | 0.0023*** | 0.0025*** | 0.0002 |
| | (5.29) | (4.95) | (-0.11) | (5.31) | (5.49) | (0.9) |
| WML | -0.0018*** | -0.002*** | -0.0002* | -0.0015*** | -0.0018*** | -0.0003** |
| | (-6.82) | (-7.36) | (-1.9) | (-6.39) | (-7.34) | (-2.51) |
| N | 1016 | 1016 | 1016 | 1273 | 1273 | 1273 |
| R² | 50.89% | 43.23% | 13.92% | 53.45% | 45.19% | 15.99% |
| Adj. R² | 50.70% | 43.00% | 13.58% | 53.30% | 45.02% | 15.73% |

*Notes: This table presents the regression results of the four-factor model (Fama & French, 1993; Carhart, 1997) for equally-weighted non-family and family portfolios. Regressions cover the period from January 2, 2007, to December 30, 2011 (daily). The specification of the dependent variable, i.e., returns on a zero investment strategy in non-family and family portfolios as well as on a strategy long on family firm portfolios and short on non-family portfolios is denoted in row 3 of the table. Portfolio returns are regressed on the market portfolio-return less the risk-free return rate (Rm-Rf), the zero-investment benchmark-factors for size (SMB) and book-to-market-value (HML) as well as the momentum effect (WML). Factor-specific data for the German stock market has been retrieved from the website of Prof. Richard Stehle. Significance at the 10%, 5% and 1% levels is indicated by \*, \*\* and \*\*\*, respectively. Test statistics are reported in parenthesis.*

**Table 3.** Euro crisis 2010–2014: Four–factor model (equally-weighted portfolios)

| | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* |
|---|---|---|---|---|---|---|
| | *2010–2011* | | | *2010–2012* | | |
| *Alpha* | -0.003*** | -0.0025*** | 0.0005** | -0.0023*** | -0.0019*** | 0.0004** |
| | (-16.4) | (-10.47) | (2.25) | (-15.42) | (-10.23) | (2.02) |
| *Rm-Rf* | 0.0087*** | 0.0086*** | 0 | 0.0083*** | 0.008*** | -0.0003 |
| | (30.64) | (23.53) | (-0.13) | (34.34) | (26.25) | (-1) |
| *SMB* | 0.0043*** | 0.0062*** | 0.002*** | 0.0038*** | 0.0054*** | 0.0016*** |
| | (11.72) | (13.19) | (4.23) | (12.1) | (13.73) | (4.17) |
| *HML* | 0.0008** | 0.0015*** | 0.0007 | 0.001*** | 0.0014*** | 0.0005 |
| | (2.48) | (3.42) | (1.54) | (3.36) | (3.91) | (1.26) |
| *WML* | 0.0011*** | 0.0003 | -0.0008** | 0.0007*** | 0.0002 | -0.0004* |
| | (3.89) | (0.72) | (-2.33) | (3.13) | (0.84) | (-1.66) |
| *N* | 513 | 513 | 513 | 767 | 767 | 767 |
| *R²* | 81.55% | 64.14% | 15.19% | 78.07% | 59.53% | 12.86% |
| *Adj. R²* | 81.40% | 63.86% | 14.52% | 77.95% | 59.32% | 12.40% |
| | *2010–2013* | | | *2010–2014* | | |
| *Alpha* | -0.0017*** | -0.0014*** | 0.0003* | -0.0015*** | -0.0012*** | 0.0003** |
| | (-12.85) | (-9.23) | (1.91) | (-12.64) | (-8.69) | (2.14) |
| *Rm-Rf* | 0.0082*** | 0.0078*** | -0.0005* | 0.008*** | 0.0074*** | -0.0006*** |
| | (35.68) | (29.27) | (-1.71) | (41.47) | (32.85) | (-2.78) |
| *SMB* | 0.0038*** | 0.0052*** | 0.0013*** | 0.0037*** | 0.0047*** | 0.001*** |
| | (13.02) | (15.27) | (3.9) | (14.86) | (16.36) | (3.46) |
| *HML* | 0.0011*** | 0.0015*** | 0.0004 | 0.0011*** | 0.0014*** | 0.0003 |
| | (4.07) | (4.89) | (1.34) | (4.81) | (5.43) | (1.26) |
| *WML* | 0.0006*** | 0.0002 | -0.0004* | 0.0006*** | 0.0005** | -0.0001 |
| | (2.97) | (0.79) | (-1.76) | (3.51) | (2.45) | (-0.55) |
| *N* | 1020 | 1020 | 1020 | 1272 | 1272 | 1272 |
| *R²* | 72.91% | 57.08% | 10.88% | 72.72% | 56.80% | 9.10% |
| *Adj. R²* | 72.80% | 56.91% | 10.53% | 72.63% | 56.67% | 8.82% |

*Notes: This table presents the regression results of the four-factor model (Fama & French, 1993; Carhart, 1997) for equally-weighted non-family and family portfolios. Regressions cover the period from January 4, 2010, to December 31, 2014 (daily). The specification of the dependent variable, i.e., returns on a zero investment strategy in non-family- and family portfolios as well as on a strategy long on family firm portfolios and short on non-family portfolios is denoted in row 3 of the table. Portfolio returns are regressed on the market portfolio-return less the risk-free return rate (Rm-Rf), the zero-investment benchmark-factors for size (SMB) and book-to-market-value (HML) as well as the momentum effect (WML). Factor-specific data for the German stock market has been retrieved from the website of Prof. Richard Stehle. Significance at the 10%, 5% and 1% levels is indicated by \*, \*\* and \*\*\*, respectively. Test statistics are reported in parenthesis.*

## 5. DISCUSSION

### 5.1. Explaining performance differences

Against the backdrop of the presented results, the question arises as to why family businesses, after being hit similarly to non-family firms by the world financial crisis in the first phase, were able to emerge with a superior stock market performance from 2010 onwards. Table 4 presents the year-by-year development of financial and performance figures for family and non-family firms. The time series of the accounting performance (ROA/ROE) of family firms decreased right from the first year of the financial crisis in 2007 onwards, while the decrease in performance of non-family firms started in 2008 and was more severe in terms of ROA. While furthermore, the decrease in revenue due to the crisis was more severe in case of family firms, non-family firms recorded a sharper decrease in the market-to-book ratio (i.e., market valuation). Sales and profitability variables confirm the notion suggested by buy-and-hold returns as well as the four-factor models, that family firms were heavily hit by the financial crisis up to 2009.

One explanation for the subsequent outperformance of family firms on the stock market might be the inherent reactions of family-owned firms to the impact of the financial crisis.

Firstly, the earlier decrease in CAPEX for firms in the family portfolio appears to confirm the arguments of Lins et al. (2013) and Zhou et al. (2017)

that investment cuts are utilized to damper crisis impacts on liquidity. Hence, unlike non-family firms who suffered a decrease of 24.1% in cash holdings in 2008, family firms did not record any decrease in cash up to 2011. Secondly, the lower leverage ratio of family firms (Table 1) suggests that these firms are more solvent, which is specifically beneficial during phases of economic distress, as it allows these firms to easier access external funding. This argument is supported by scholars finding family firms as being less subject to credit restrictions compared to non-family firms during financial crises (Crespí & Martín-Oliver, 2015). Furthermore, government measures such as short-time working might support the liquidity of firms that are still solvent. Thirdly, summary statistics confirm findings of Sraer and Thesmar (2007) and Mietzner and Tyrell (2012) — family firms appear to execute layoffs rather as a reactive, than a proactive strategy to cope with surging financial crises. The same appears to be the case for R&D spending (as long as family firms are not financially constrained, see Sun et al., 2019). These observations are in line with family firms protecting their long-term success while accepting negative impacts on short-term performance in coping with negative economic consequences of the crises. Many family firms in Germany, for example, are located in rural areas where it is comparably difficult to attract skilled workers or engineers. Holding on to employees (or laying them off only as a subordinated reaction strategy to crises) may offer a significant competitive advantage when business activities

increase again. This notion is supported by the first findings in a working paper by Amore et al. (2021) who find firms with controlling family shareholders to outperform non-family firms during the recent COVID-19-crisis primarily in labor-intense industries.

**Table 4.** Operating performance by year (median)

| | *2006* | *2007* | *2008* | *2009* | *2010* | *2011* | *2012* | *2013* | *2014* |
|---|---|---|---|---|---|---|---|---|---|
| *Family firms* | | | | | | | | | |
| Total assets (in mln) | 127.4 | 147.7 | 164.4 | 161.4 | 167.2 | 177.8 | 186.0 | 232.4 | 249.5 |
| Revenue (in mln) | 166.1 | 168.3 | 217.3 | 181.3 | 207.3 | 211.8 | 208.7 | 266.3 | 308.5 |
| Cash (in % total assets) | 6.88 | 8.04 | 8.08 | 9.31 | 10.39 | 8.73 | 9.65 | 10.44 | 8.35 |
| Current ratio | 1.67 | 1.76 | 1.65 | 1.89 | 1.88 | 1.78 | 1.77 | 1.74 | 1.64 |
| Return on assets (in %) | 7.12 | 6.85 | 6.03 | 4.18 | 5.86 | 6.18 | 5.1 | 4.35 | 4.67 |
| Return on equity (in %) | 14.46 | 13.55 | 12.32 | 7.12 | 11.42 | 11.22 | 9.45 | 8.17 | 10.19 |
| Price/earnings ratio | 20.8 | 17.55 | 16.8 | 9.25 | 17.55 | 17.65 | 13.5 | 15.95 | 18.65 |
| Market-to-book ratio | 1.62 | 1.75 | 1.72 | 1.06 | 1.31 | 1.76 | 1.44 | 1.61 | 1.95 |
| Equity ratio | 48.19 | 45.16 | 43.53 | 44.56 | 47.55 | 50.64 | 49.01 | 47.58 | 46.19 |
| CAPEX (in % net PPE) | 25.26 | 27.74 | 26.81 | 22.27 | 21.14 | 22.35 | 24.97 | 24.76 | 21.01 |
| R&D (in % revenue) | 2.3 | 2.42 | 2.39 | 2.53 | 2.22 | 2.55 | 2.74 | 2.71 | 2.67 |
| Dividend/share | 35.21 | 35.71 | 34.21 | 42.66 | 41.2 | 40.67 | 39.21 | 38.49 | 38.79 |
| Dividend yield | 1.76 | 1.89 | 2.29 | 4.35 | 3.28 | 1.92 | 3.05 | 2.77 | 2.29 |
| Closely held shares (in %) | 52.7 | 52.1 | 55.9 | 56.06 | 53.29 | 56.07 | 59.57 | 56.5 | 56.36 |
| No. of employees | 1,168 | 1,189 | 1,513 | 2,420 | 1,492 | 1,337 | 1,382 | 1,455 | 1,909 |
| *Non-family firms* | | | | | | | | | |
| Total assets (in mln) | 224.7 | 222.0 | 243.5 | 254.8 | 243.8 | 257.6 | 318.3 | 425.8 | 424.7 |
| Revenue (in mln) | 257.4 | 268.0 | 309.1 | 302.9 | 291.7 | 377.2 | 396.7 | 424.6 | 466.8 |
| Cash (in % total assets) | 7.01 | 8.5 | 6.45 | 9.16 | 10 | 8.91 | 9.8 | 10.01 | 10.61 |
| Current ratio | 1.6 | 1.53 | 1.39 | 1.42 | 1.59 | 1.54 | 1.63 | 1.6 | 1.56 |
| Return on assets (in %) | 4.79 | 4.82 | 4.58 | 2.33 | 4.65 | 4.94 | 5.11 | 4.99 | 4.1 |
| Return on equity (in %) | 10.55 | 10.88 | 8.76 | 5.71 | 10.05 | 10.54 | 10.56 | 10.98 | 8.81 |
| Price/earnings ratio | 18.85 | 21.6 | 18.6 | 9.05 | 19.7 | 17.65 | 12.3 | 15.8 | 18.8 |
| Market-to-book ratio | 1.94 | 1.9 | 2.15 | 1.17 | 1.34 | 1.74 | 1.42 | 1.6 | 1.8 |
| Equity ratio | 39.37 | 37.74 | 35.84 | 37.91 | 40.77 | 42.56 | 39.67 | 39.39 | 37.23 |
| CAPEX (in % net PPE) | 21.61 | 22.07 | 23.67 | 18.37 | 17.71 | 20.83 | 19.77 | 20.62 | 21.58 |
| R&D (in % revenue) | 3.7 | 3.49 | 3.37 | 3.65 | 3.49 | 3.45 | 3.16 | 2.87 | 2.93 |
| Dividend/share | 34.73 | 34.38 | 34.85 | 37.73 | 36.63 | 32.31 | 36.09 | 37.6 | 40.24 |
| Dividend yield | 1.98 | 1.82 | 1.9 | 3.56 | 2.93 | 2.08 | 2.9 | 2.5 | 2.28 |
| Closely held shares (in %) | 30.34 | 29.93 | 31.68 | 29.22 | 29.44 | 32.93 | 35.07 | 39.68 | 29.29 |
| No. of employees | 4,327 | 5,791 | 5,480 | 6,679 | 4,916 | 2,456 | 6,075 | 6,530 | 4,421 |

*Notes: This table reports the median of selective financial characteristics of firms with > 25% family ownership and non-family firms.*

Yet another reason for the outperformance after the rock bottom of the world financial crisis from 2010 onwards might be the inherent reaction of investors on the stock market. Eugster and Isakov (2019) record that the market may be positively surprised by good operative performances of family firms — specifically in terms of ROA. As Table 4 reveals, while non-family firms still record a decrease in revenues from 2009 to 2010, family firms grow both by total assets and revenue. Doing so they also recover in their profitability (ROA, ROE, price, and earnings ratio) — despite the fact that in 2010 the European economy recorded the first hits of the uprising Euro crisis.

Lastly, the corporate governance notion of family firms might support the comparably good performance of family firms. Stock market performance of both family and non-family firms in the financial crisis is moderated by the corporate governance of these firms (Aldamen et al., 2020). Franzoi and Mietzner (2021) show that the market generally regards the influence of family blockholders in firms as beneficial for corporate governance in Germany. Our results are in line with this finding. Minor differences in the observed returns and coefficients are due to the fact, that the research design of Franzoi and Mietzner (2021) applies yearly rebalanced portfolios and additional governance data. This paper uses portfolios formed at the year-end of 2006 as such a rebalancing is not applicable for the given research question. Furthermore, our family firm definition applies a stronger ownership threshold of 25% (blocking minority) as with regards to the high share of family wealth that family blockholders invested in their firms (Anderson et al., 2003), the participation in management boards considered in the other study design is less relevant for our research question that covers financial crises threatening both the firm and family wealth. Our results extend the work of Franzoi and Mietzner (2021) by suggesting that after controlling for other size and performance factors in our model, the beneficial influence attributed to the governance involvement of family shareholders holds true particularly during in and after financial crises. In addition, dividend policies as suggested by summary statistics do not call for caution of minority shareholders regarding a strong influence of family blockholders in corporate governance. Observed dividend trends do not support considerations of expropriation by controlling family blockholders as sometimes noted by literature. Unlike suggested by Attig, Boubakri, El Ghoul, and Guedhami (2016), for example, family firms appear to have cut dividends to a lesser extent than firms in the non-family portfolio (Table 4).

## 5.2. Robustness and contribution

Our results raise certain concerns regarding robustness. Despite the fact that family firms are smaller than non-family firms by total assets, revenue and also market capitalization, listed firms in Germany also generally strongly vary in their capitalization (Achleitner et al., 2019). For robustness purposes, we re-ran all regression

models with portfolios weighted by the market capitalization of the comprised companies to account for potential distortions by small/large firms (Eugster & Isakov, 2019). The estimated value-weighted models reveal similar results, support our previous findings based on equally-weighted portfolios and are reported in Appendix: Table A.3 (world financial crisis) and Table A.4 (Euro crisis). Furthermore, for concerns regarding the employed four-factor model, we re-estimated all time frames with three- and five-factor models by applying Europe-specific factors retrieved from Kenneth R. French's website. Both the equally- as well as the value-weighted variants confirm our findings derived from the Germany-specific four-factor model (results not reported and available upon request).

Robustness tests corroborate our empirical results that contribute both to academic and practical aspects. Our findings add to the year-long academic discussion on the performance of family and non-family firms by showing that phases of the economic recession may be analyzed separately when investigating performance differences. Furthermore, the results confirm literature on the resilience of family firms (Amann & Jaussaud, 2012; Minichilli et al., 2016) that appear to adapt to and absorb exogenous chocks with a combination of financial preconditions as well as intrinsic and long-term oriented features of family blockholders.

Lastly, our study has important practical implications. For investors in family-controlled firms, our results suggest that even when these firms exhibit a financial behavior that may not appear as solely driven by economic decisions during financial crises, these firms and subsequently investors may profit from a superior performance after such periods. Most importantly, the findings support public policies of protecting current ownership structures of widespread family ownership in both listed and non-listed family firms (Minichilli et al., 2016). Family firms may damper macro-economic shocks through society, for example, because they are more cautious with layoffs while performing stronger than non-family firms in the mid- and long-run potentially benefitting the general economic recovery of countries with high levels of family ownership.

## 6. CONCLUSION

Differences in the performance between family and non-family firms are widely noted by scholars. Only recently, publications also focus on differences in financial behavior during financial crises. Studies on the stock market performance of family firms during and after economic shocks are rare. Observing German listed companies, we employ the world financial crisis and the Euro crisis as an exogenous shock to the earnings and performance of firms and document that family firms record excess stock market returns not later than three years after the outbreak of the first crisis. We find family firm portfolios outperforming non-family portfolios by 7.95–10.68% (world financial crisis) and 7.92–13.59% (Euro crisis) on an annualized level.

With regards to explanations for these findings, we follow that family firms react differently in the financial crisis than non-family firms, even though their reaction might hamper short-term performance. They appear to apply CAPEX-investment cuts to preserve liquidity while having better access to additional external funding due to their lower *ex-ante* leverage ratio. Furthermore, they appear to use personnel layoffs and cuts in R&D, which might endanger the long-term success of the firm, as a subordinated reaction strategy to crises and hence enable immediate productivity when markets recover. We find this behavior of family-owned firms aligned with families protecting their socioemotional wealth and the long-term survival of the family and the firm. While minority shareholders might be worse off in the first place by short-term earnings being hurt by delayed cuts in the workforce or operative spending in a crisis, the smaller decrease in dividends per share compared to non-family firms does not support the notion of expropriation by family blockholders.

Due to the specific corporate governance framework and the fact that family members are frequently engaged in corporate boards as well as country-specific financial features such as the lower leverage ratio of family firms in Germany, our results are primarily limited to German listed firms. Hence, we highly encourage future studies to further explore the performance of family firms in periods of the economic downturn in other Continental European countries with a similar corporate governance system (e.g., Austria). Our study is particularly relevant for future research as it adds to the few existing publications investigating specifically the financial crises behavior of family firms and thereby broadens the range of available empirical literature in a research topic that is yet to be explored in more detail.

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## APPENDIX

**Table A.1.** Market performance

| | No. firms | Holding period | | | Statistics | | | |
|---|---|---|---|---|---|---|---|---|
| | | *Start* | *End* | *N* | *Mean* | *t* | *Median* | *z* |
| *2007–2011* | | | | | | | | |
| Family firms | 114 | January 2, 2007 | December 30, 2011 | 1304 | 0.079 | 182.37 | -0.011 | 31.28 |
| Non-family firms | 112 | January 2, 2007 | December 30, 2011 | 1304 | 0.055 | 218.44 | -0.019 | 31.28 |
| Diff. in mean/median | | | | | 0.024 | 3.19 | 0.009 | 4.25 |
| *2010–2014* | | | | | | | | |
| Family firms | 114 | January 4, 2010 | December 31, 2014 | 1303 | 0.550 | 176.20 | 0.365 | 31.27 |
| Non-family firms | 112 | January 4, 2010 | December 31, 2014 | 1303 | 0.425 | 185.33 | 0.273 | 31.27 |
| Diff. in mean/median | | | | | 0.125 | 10.68 | 0.091 | 16.26 |

*Notes: This table reports the mean and median return of firms in the portfolios with no-family ownership and > 25% family ownership as well as the results of the test statistics on the means (ttest) and medians (Wilcoxon rank test) of the firms in the non-family vs. family portfolio. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Frequency indicates the number of days within the holding period.*

**Table A.2.** Long-term performance post world financial crisis 2007–2017: Three-factor model

| | Equally-weighted portfolios | | | Value-weighted portfolios | | |
|---|---|---|---|---|---|---|
| | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* |
| | *2007–2017* | | | *2007–2017* | | |
| *Alpha* | -0.0018*** | -0.0016*** | 0.0002* | -0.0018*** | -0.0016*** | 0.0002* |
| | (-11.55) | (-10.84) | (1.76) | (-11.64) | (-10.84) | (1.79) |
| *Rm-Rf* | 0.0055*** | 0.0053*** | -0.0002* | 0.0055*** | 0.0053*** | -0.0002* |
| | (31) | (31.14) | (-1.84) | (31.07) | (31.14) | (-1.68) |
| *SMB* | 0.0024*** | 0.004*** | 0.0016*** | 0.0024*** | 0.004*** | 0.0016*** |
| | (5.91) | (10.16) | (5.57) | (5.81) | (10.16) | (5.79) |
| *HML* | -0.0005 | -0.0011*** | -0.0005** | -0.0006 | -0.0011*** | -0.0005** |
| | (-1.48) | (-3.13) | (-2.2) | (-1.56) | (-3.13) | (-2.12) |
| *N* | 2868 | 2868 | 2868 | 2868 | 2868 | 2868 |
| *R²* | 36.55% | 31.97% | 4.39% | 36.74% | 31.97% | 4.42% |
| *Adj. R²* | 36.48% | 31.90% | 4.29% | 36.67% | 31.90% | 4.32% |

*Notes: This table presents the regression results of the three-factor model (Fama & French, 1993; Carhart, 1997) for both equally- as well as value-weighted non-family and family portfolios. Regressions cover the period from January 2, 2007, to December 27, 2017. The specification of the dependent variable, i.e., returns on a zero investment strategy in non-family- and family portfolios as well as on a strategy long in family firm portfolios and short on non-family portfolios is denoted in row 3 of the table. Portfolio returns are regressed on the market portfolio-return less the risk-free return rate (Rm-Rf), the zero-investment benchmark-factors for size (SMB) and the book-to-market-value (HML). Factor-specific data for the European stock market has been retrieved from the website of Prof. Kenneth R. French. Significance at the 10%, 5% and 1% levels is indicated by \*, \*\* and \*\*\*, respectively. Test statistics are reported in parenthesis.*

**Table A.3.** World financial crisis 2007–2011: Four-factor model (value-weighted portfolios)

| | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* |
|---|---|---|---|---|---|---|
| | *2007–2008* | | | *2007–2009* | | |
| *Alpha* | -0.0156*** | -0.0153*** | 0.0002 | -0.0114*** | -0.0112*** | 0.0002 |
| | (-33.23) | (-31.56) | (1.1) | (-29.16) | (-27.64) | (1.11) |
| *Rm-Rf* | 0.0089*** | 0.0091*** | 0.0002 | 0.0099*** | 0.0097*** | -0.0002 |
| | (16.88) | (16.58) | (0.66) | (20.55) | (19.45) | (-0.84) |
| *SMB* | 0.0049*** | 0.0071*** | 0.0022*** | 0.0062*** | 0.008*** | 0.0018*** |
| | (7.01) | (9.74) | (6.56) | (10.12) | (12.54) | (6.09) |
| *HML* | 0.0006 | 0.001 | 0.0003 | 0.0022*** | 0.0023*** | 0.0001 |
| | (0.75) | (1.13) | (0.89) | (3.56) | (3.65) | (0.47) |
| *WML* | -0.0018*** | -0.0021*** | -0.0003* | -0.002*** | -0.0022*** | -0.0002* |
| | (-5.51) | (-6.13) | (-1.8) | (-6.89) | (-7.44) | (-1.75) |
| *N* | 506 | 506 | 506 | 760 | 760 | 760 |
| *R²* | 54.60% | 50.02% | 18.24% | 52.95% | 46.76% | 17.31% |
| *Adj. R²* | 54.23% | 49.63% | 17.58% | 52.70% | 46.48% | 16.88% |
| | *2007–2010* | | | *2007–2011* | | |
| *Alpha* | -0.009*** | -0.0086*** | 0.0004** | -0.008*** | -0.0077*** | 0.0003** |
| | (-27.41) | (-24.87) | (2.16) | (-29.28) | (-26.64) | (2.24) |
| *Rm-Rf* | 0.0102*** | 0.01*** | -0.0002 | 0.0101*** | 0.01*** | -0.0001 |
| | (24.45) | (22.62) | (-1) | (29.2) | (27.29) | (-0.79) |
| *SMB* | 0.0064*** | 0.0081*** | 0.0017*** | 0.0063*** | 0.0081*** | 0.0018*** |
| | (11.71) | (13.99) | (6.18) | (13.68) | (16.73) | (7.5) |
| *HML* | 0.0026*** | 0.0027*** | 0.0001 | 0.0022*** | 0.0025*** | 0.0003 |
| | (5.11) | (4.95) | (0.27) | (5.13) | (5.49) | (1.25) |
| *WML* | -0.0018*** | -0.002*** | -0.0002* | -0.0015*** | -0.0018*** | -0.0003** |
| | (-6.88) | (-7.36) | (-1.82) | (-6.48) | (-7.34) | (-2.38) |
| *N* | 1016 | 1016 | 1016 | 1273 | 1273 | 1273 |
| *R²* | 50.72% | 43.23% | 14.23% | 53.25% | 45.19% | 16.12% |
| *Adj. R²* | 50.53% | 43.00% | 13.89% | 53.10% | 45.02% | 15.85% |

*Notes: This table presents the regression results of the four-factor model (Fama & French, 1993; Carhart, 1997) for value-weighted non-family and family portfolios. Regressions cover the period from January 2, 2007, to December 30, 2011 (daily). The specification of the dependent variable, i.e., returns on a zero investment strategy in non-family- and family portfolios as well as on a strategy long on family firm portfolios and short on non-family portfolios is denoted in row 3 of the table. Portfolio returns are regressed on the market portfolio-return less the risk-free return rate (Rm-Rf), the zero-investment benchmark-factors for size (SMB) and book-to-market-value (HML) as well as the momentum effect (WML). Factor-specific data for the German stock market has been retrieved from the website of Prof. Richard Stehle. Significance at the 10%, 5% and 1% levels is indicated by \*, \*\* and \*\*\*, respectively. Test statistics are reported in parenthesis.*

**Table A.4.** Euro crisis 2010–2014: Four-factor model (value-weighted portfolios)

| | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* | *Non-family-risk-free* | *Family-risk-free* | *Family-non-family* |
|---|---|---|---|---|---|---|
| | *2010–2011* | | | *2010–2012* | | |
| Alpha | -0.003*** | -0.0025*** | 0.0005** | 0.0005*** | 0.0009*** | 0.0003* |
| | (-16.47) | (-10.47) | (2.19) | (3.02) | (4.28) | (1.8) |
| Rm-Rf | 0.0086*** | 0.0086*** | 0.0001 | 0.005*** | 0.0045*** | -0.0005** |
| | (30.47) | (23.53) | (0.21) | (22.82) | (17.86) | (-2.13) |
| SMB | 0.0042*** | 0.0062*** | 0.0021*** | 0.0026*** | 0.0043*** | 0.0017*** |
| | (11.46) | (13.19) | (4.52) | (4.99) | (7.15) | (3.05) |
| HML | 0.0008** | 0.0015*** | 0.0007 | 0 | 0.0002 | 0.0002 |
| | (2.4) | (3.42) | (1.62) | (-0.08) | (0.25) | (0.34) |
| WML | 0.001*** | 0.0003 | -0.0008** | -0.0001 | 0.0008 | 0.0009 |
| | (3.81) | (0.72) | (-2.24) | (-0.18) | (0.79) | (1.02) |
| N | 513 | 513 | 513 | 781 | 781 | 781 |
| R² | 81.54% | 64.14% | 14.86% | 64.34% | 45.71% | 9.31% |
| Adj. R² | 81.39% | 63.86% | 14.19% | 64.11% | 45.36% | 8.73% |
| | *2010–2013* | | | *2010–2014* | | |
| Alpha | -0.0017*** | -0.0014*** | 0.0003* | -0.0015*** | -0.0012*** | 0.0003** |
| | (-12.99) | (-9.23) | (1.87) | (-12.95) | (-8.69) | (2.19) |
| Rm-Rf | 0.0081*** | 0.0078*** | -0.0004 | 0.0079*** | 0.0074*** | -0.0006** |
| | (35.76) | (29.27) | (-1.33) | (41.88) | (32.85) | (-2.43) |
| SMB | 0.0037*** | 0.0052*** | 0.0014*** | 0.0036*** | 0.0047*** | 0.0011*** |
| | (12.85) | (15.27) | (4.23) | (14.77) | (16.36) | (3.84) |
| HML | 0.0011*** | 0.0015*** | 0.0004 | 0.0011*** | 0.0014*** | 0.0003 |
| | (4.06) | (4.89) | (1.4) | (4.87) | (5.43) | (1.31) |
| WML | 0.0006*** | 0.0002 | -0.0004* | 0.0006*** | 0.0005** | -0.0001 |
| | (2.94) | (0.79) | (-1.71) | (3.67) | (2.45) | (-0.63) |
| N | 1020 | 1020 | 1020 | 1272 | 1272 | 1272 |
| R² | 73.19% | 57.08% | 10.72% | 73.34% | 56.80% | 9.20% |
| Adj. R² | 73.08% | 56.91% | 10.36% | 73.26% | 56.67% | 8.92% |

*Notes: This table presents the regression results of the four-factor model (Fama & French, 1993; Carhart, 1997) for value-weighted non-family and family portfolios. Regressions cover the period from January 4, 2010, to December 31, 2014 (daily). The specification of the dependent variable, i.e., returns on a zero investment strategy in non-family- and family portfolios as well as on a strategy long on family firm portfolios and short on non-family portfolios is denoted in row 3 of the table. Portfolio returns are regressed on the market portfolio-return less the risk-free return rate (Rm-Rf), the zero-investment benchmark-factors for size (SMB) and book-to-market-value (HML) as well as the momentum effect (WML). Factor-specific data for the German stock market has been retrieved from the website of Prof. Richard Stehle. Significance at the 10%, 5% and 1% levels is indicated by \*, \*\* and \*\*\*, respectively. Test statistics are reported in parenthesis.*