



School of Economics and Management

Family vs. Non-family Firm Resilience During Covid-19: Evidence from Dutch Listed Firms

Master Thesis Finance

Author Bob J. Jansen

SNR 2123665

ANR 534875

Supervisor: Dr. Vincenzo Pezone

Second reader: Prof. Dr. Fabio Braggion

Date: 24-07-2025

Abstract

The COVID-19 pandemic caused a remarkable shock globally, disrupting financial stability, labour markets, and operational continuity. This study examines the differential impact of COVID-19 on the performance of family and non-family firms. Using a Difference-in-Difference approach, it investigates a dataset of 110 firms listed on the Dutch stock exchange from 2017 to 2023. The analysis focuses on two main areas: financial performance, measured by Return on Equity and Return on Assets, and employment outcomes, measured by the logarithm of the number of employees and average wages. Although family firms seemed to perform slightly better than non-family firms across all financial and employment metrics, the results indicate that these differences were small in economic terms and not statistically significant. Additionally, no strong association is found between employment retention and financial performance, suggesting that preserving human capital did not significantly influence financial results during the crisis. However, a difference appears in capital structure: family firms tend to maintain lower leverage ratios than non-family firms, aligning with theories of financial conservatism and risk aversion. Moreover, there is no statistically significant evidence that family firms changed their leverage differently during the COVID-19 pandemic compared with non-family firms. This study adds to the existing literature by providing firm-level evidence from the Netherlands. It questions prevailing theories that suggest family firms are more resilient based on agency and capital structure theories. The findings suggest that ownership structure alone is insufficient to determine a firm's resilience during large-scale economic shocks.

Keywords: Family firms; Performance; COVID-19; Ownership; Performance.

Acknowledgments

I present to you my master's thesis: "Family vs. Non-family Resilience During Covid-19: Evidence from Dutch Listed Firms". It is written for the completion of the MSc Finance at Tilburg University. I was engaged in researching and writing this thesis from January to July 2025.

I want to express my sincere gratitude to my supervisor, Vincenzo Pezone, for his knowledge and support. His guidance has been insightful in shaping this master's thesis. Finally, I would like to thank my friends and family for their support throughout the completion of my master's degree.

Bob J. Jansen

Table of Contents

Introduction	6
2. Literature Review and Hypotheses Development	10
2.1 <i>Defining family firms</i>	<i>10</i>
2.2 <i>The Impact of Economic Shocks on Firms</i>	<i>11</i>
2.3 <i>The Agency Theory</i>	<i>12</i>
2.4 <i>Capital Structure Theories</i>	<i>13</i>
3. Data.....	16
3.1 <i>Data Source and Sample Collection.....</i>	<i>16</i>
3.2 <i>Variable Construction.....</i>	<i>18</i>
3.2.1 <i>Dependent variables.....</i>	<i>18</i>
3.2.2 <i>Independent variables</i>	<i>18</i>
3.2.3 <i>Control variables</i>	<i>21</i>
3.3 <i>Descriptive Statistics</i>	<i>22</i>
4. Methodology	24
4.1 <i>Empirical Strategy.....</i>	<i>24</i>
4.2 <i>Additional Features</i>	<i>27</i>
4.3 <i>Robustness Tests</i>	<i>27</i>
5. Results	29
5.1 <i>The Parallel Trends Assumption.....</i>	<i>29</i>
5.2 <i>Regression Analyses</i>	<i>31</i>
5.2.1 <i>Financial Performance</i>	<i>31</i>
5.2.2 <i>Employment Retention and Wage Stability</i>	<i>32</i>
5.2.3 <i>Leverage.....</i>	<i>35</i>
5.2.4 <i>Financial Offer for Job Retention</i>	<i>38</i>
5.3 <i>Robustness Tests</i>	<i>39</i>
6.1 <i>Theoretical and Empirical Contributions.....</i>	<i>40</i>
6.2 <i>Limitations and Recommendations for Future Research.....</i>	<i>41</i>
Usage of AI	43

References	44
Appendix	47
<i>Appendix A: Classification of all Family Firms</i>	<i>47</i>
<i>Appendix B: Descriptive statistics</i>	<i>53</i>
<i>Appendix C: Additional Results</i>	<i>55</i>
<i>Appendix D: Robustness Analysis</i>	<i>57</i>

Introduction

The COVID-19 pandemic caused an extraordinary shock worldwide, disrupting financial stability, labour markets, and operational continuity (Schneider et al., 2024). During such times of economic uncertainty, questions arise regarding the influence of firm-specific factors, such as ownership structure, on organisational resilience. Family firms, which form a large share of businesses globally and in the Netherlands, are often perceived as more resilient due to their long-term focus, stable leadership, and stronger stakeholder relationships (Tsoutsoura, 2021; Anderson & Reeb, 2003; Bertrand & Schoar, 2006). However, it remains uncertain whether these perceived advantages lead to measurable results during crises. The pandemic, as an external and universal shock, provides an empirical opportunity to examine whether family firms truly performed better under pressure compared with their non-family counterparts.

Although existing literature explores the performance of family firms under stable economic conditions, fewer studies examine how these firms handle large-scale crises. Moreover, prior research has primarily focused on financial outcomes, often overlooking other important aspects that can reflect the firm's strategic priorities and stakeholder commitment, such as employment retention. This thesis extends the existing literature by assessing not only financial performance, measured through Return on Equity and Return on Assets, but also employment-related outcomes, such as workforce size and average wages. Using firm-level data from Dutch listed companies and a Difference-in-Difference methodology, the study fills a critical gap by providing empirical evidence on whether the assumed resilience of family firms holds during an unprecedented global crisis.

This thesis explores whether Dutch family firms showed greater resilience than non-family firms during the COVID-19 pandemic. The main research question is: *How did family firms perform compared with non-family firms in terms of financial results, employment levels, and wage stability during COVID-19?* This question arises from the ongoing debate in corporate governance about whether family ownership is a stabilising factor during economic uncertainty. Due to their long-term focus, stronger relational capital, and strategies aimed at maintaining control, family firms are believed to be more resistant to external shocks (Zhou et al., 2017; Bauweraerts, 2013; Amann & Jaussau, 2011). However, empirical evidence remains mixed, particularly in the context of large-scale crises.

To answer this question comprehensively, the thesis focuses on two dimensions of firm performance: financial performance and employment-related outcomes. Financial resilience is measured through changes in Return on Equity (*ROE*) and Return on Assets (*ROA*). At the same

time, employment retention is captured via the logarithm of the number of employees and the average wage level. These dimensions form the basis of the first two sub-questions: *Did family firms experience a difference in financial performance relative to non-family firms during the pandemic?* and *Were family firms more likely to preserve jobs and maintain wage levels during the pandemic?*

Building on these two dimensions, the thesis also considers a third question: *Are the differences in financial performance during the pandemic associated with variations in employment-related outcomes?* This question reflects the idea that family firms' financial performance may have been affected by their labour decisions, specifically their willingness to retain employees and maintain wage levels during economic downturns. This approach allows a more nuanced understanding of the role of family firms in responding to economic shocks.

To analyse the differential impact of the COVID-19 pandemic on family and non-family firms, this thesis employs a panel dataset of 110 Dutch listed firms covering the period from 2017 to 2023. Financial data, including *ROE*, *ROA*, total assets, leverage, and wage expenses, were sourced from the ORBIS database. Information on firm ownership and governance was manually gathered from annual reports and other public disclosures. Firms are categorised as family firms if one or more family members collectively own at least 20% of the voting rights and occupy a board or executive role. This dual criterion ensures that both financial control and active involvement in decision-making are captured, providing a more accurate identification of family firms compared with studies that rely solely on ownership thresholds.

To isolate the effect of the COVID-19 shock, a Difference-in-Differences methodology with two-way fixed effects is employed. This empirical approach is well-suited to the research design because it enables the estimation of causal effects by comparing changes in outcomes between treated (family firms) and control (non-family firms) groups before and after the onset of the pandemic. The use of firm and year fixed effects helps control for time-invariant heterogeneity and macroeconomic shocks. Meanwhile, one-year lagged control variables, such as firm size (measured as the log of total assets), leverage, and Tobin's *Q*, are included to account for observable firm-specific factors. This methodological framework provides a robust setting to test the hypotheses, ensuring that outcome differences can be credibly attributed to ownership structure rather than confounding variables.

The empirical analysis shows no statistically significant evidence that family firms in the Netherlands outperformed non-family firms during the COVID-19 crisis. Although the interaction term between the COVID-19 period and family firm status is consistently positive for *ROE* across different model specifications, the coefficients remain statistically insignificant.

In some models, *ROA* coefficients are even slightly negative, further emphasising the lack of measurable financial advantage for family firms during the pandemic. These findings suggest that while family firms may have experienced a less severe decline in profitability, the difference is not substantial enough to draw definitive conclusions.

Regarding employment-related outcomes, the findings remain inconclusive. The interaction term for family firms during the COVID-19 period is slightly positive in both the *log(Employees)* and *log(Wage)* regressions, indicating that family firms may have retained more staff and offered higher average wages compared with their non-family counterparts. However, these effects do not reach statistical significance. Practically, this suggests that while family firms might have been marginally more inclined to preserve employment and wage levels, the size and consistency of these effects are too weak to support the hypothesis regarding employment-related outcomes. Interestingly, while leverage is used as a control variable in models of financial and employment outcomes, it is also analysed separately to assess whether capital structure differs across ownership types. The findings show that family firms have significantly lower leverage ratios compared with non-family firms, consistent with theories suggesting that family ownership is associated with financial conservatism and reduced reliance on debt. Moreover, there is no statistically significant evidence that family firms adjusted their leverage differently from non-family firms during the COVID-19 crisis.

Finally, when testing the last hypothesis, the results show no significant association between employment outcomes and financial performance. Although family firms retained slightly more employees and maintained marginally higher wages during the crisis, these differences were not reflected in lower *ROE* or *ROA* during the crisis. This suggests that employment-related decisions were not a primary driver of financial resilience during COVID-19.

The findings of this thesis can be directly compared to those of Anderson and Reeb (2003), who find that family firms in the S&P 500 outperform non-family firms in terms of Return on Assets. Their results are grounded in the argument that family ownership aligns management and shareholder interests, thereby reducing agency costs and promoting long-term decision-making. In contrast, this thesis does not find statistically significant evidence that Dutch family firms performed better during the COVID-19 crisis in terms of Return on Equity or Return on Assets. One possible explanation for this divergence lies in the context: the U.S. setting of Anderson and Reeb's study differs substantially from the Dutch institutional environment, where different legal protections and market structures may reduce the influence of ownership type.

A more recent comparison is offered by Zhou et al. (2017), who report that U.S. founder-led firms demonstrated superior financial performance during the 2008-2009 financial crisis. They attribute this to more cautious investment behaviour and stronger reputational ties with creditors, enabling better access to capital under stress. While the present study also investigates firm behaviour during a systemic crisis, the results do not show a similar advantage for Dutch family firms during COVID-19. This suggests that the resilience mechanisms identified by Zhou et al. (2017), such as founder involvement and conservative strategy, may not generalise across all types of family firms or institutional contexts.

The results of this thesis show no statistically significant differences between family and non-family firms during the COVID-19 pandemic. Although family firms exhibited slightly higher coefficients for *ROE* and employment-related outcomes, these differences were not statistically significant. These findings suggest that ownership alone does not reliably predict a firm's resilience during a crisis. However, the study has several limitations. The classification of family firms, although based on established criteria, may not fully capture informal or indirect family influence. The sample is limited to listed Dutch firms, which reduces the generalisability of the findings to other types of companies or institutional contexts. Additionally, focusing solely on quantitative indicators overlooks other important aspects, such as strategic adaptability and reputational capital. Future research could address these limitations by incorporating qualitative data, expanding the analysis to include private or international firms, or exploring alternative resilience mechanisms beyond accounting and employment metrics.

The remainder of the thesis is organised as follows. The next chapter reviews the relevant literature on family firm governance, capital structure, and firm behaviour during economic crises, and develops five testable hypotheses based on theoretical and empirical evidence. The third chapter describes the data sources, sample construction, and variable definitions, followed by the methodology chapter, which explains the Difference-in-Differences estimation strategy and various robustness checks. The fifth chapter presents the main regression results and compares the outcomes across different model specifications. The final chapter concludes with a discussion of the key findings, theoretical implications, limitations, and suggestions for future research.

2. Literature Review and Hypotheses Development

This chapter provides the theoretical foundation and formulates the hypotheses for this research. By reviewing prior literature on family firms, a conceptual framework is developed to assess the differences in performance between family and non-family firms during the COVID-19 pandemic. It begins by defining the term family firm, then discusses the effect of family ownership on firm behaviour, especially under economic shocks. By analysing past crises and their impacts on resilience, it underlines the relevance of frameworks such as Agency Theory and capital structure theories. These studies aim to investigate how family firms may differ in terms of financial resilience, employment retention, and the balance between profitability and long-term interests during the COVID-19 crisis. Hypotheses are developed based on empirical and theoretical literature at the end of each subsection.

2.1 Defining family firms

The literature on family firms is extensive, and there is little consensus on a precise definition of a family firm. A typical family business is generally described as an organisation controlled and often managed by multiple family members from different generations (Anderson and Reeb, 2003). However, there is no universal agreement because family firms are not defined by a single, widely accepted criterion in previous research. Essentially, a family firm is characterised by family members being involved in key aspects such as ownership, management, and control (Villalonga and Amit, 2006). Anderson and Reeb (2003) suggest that family ownership is the most crucial factor in identifying family firms, particularly when a notable proportion of the organisation's equity is owned by the founder's family or family members in management roles. The most common definitions are based on family control, which can be evaluated through ownership interests or positions on the board of directors (Faccio & Lang, 2002; La Porta, Lopez-de-Silanes, & Shleifer, 1999).

Despite these commonalities, existing research shows variation in the proportion of voting rights held by family members when determining whether a firm qualifies as a family firm. For example, Villalonga and Amit (2006) identify nine different definitions that vary from the least restrictive, where any amount of shares is owned by a family member, to the most restrictive definitions, under which the family is the largest shareholder or holds at least 20% of the voting stock. Some studies use a threshold of 5% of the voting shares held by family members to define family firms, while, for example, Maury (2006) adopts a more restrictive criterion, which requires a family to own at least 20% of the voting stock. The family's role in management can also be a determining factor, where active family control is present if a family

member holds the CEO position, other management roles, or is a board member (Anderson & Reeb, 2003).

In practice, family firms are often characterised by a combination of ownership control and family involvement in decision-making, fostering a long-term strategic focus. For this research, we use a definition that incorporates both ownership and governance criteria: 1) a single family member or multiple family members together need to own at least 20% of a firm's voting rights (direct or indirect), and 2) at least one family member serves on the board or has an executive position. This definition aligns with previous literature (Anderson & Reeb, 2003; Villalonga & Amit, 2006; Volpin, 2002), and it gives a clear distinction between family and non-family firms in this study of firm performance during the COVID-19 pandemic.

2.2 The Impact of Economic Shocks on Firms

While previous research on family firms focused on times of economic stability (Anderson & Reeb, 2003; Villalonga & Amit, 2006), challenging situations, like recessions, provide a unique environment to test the resilience and adaptability of family firms. Anderson and Reeb (2003), for example, find that family firms outperform non-family firms in terms of Return on Assets (*ROA*) in stable economic environments. However, whether this performance advantage persists under crisis conditions remains an open question.

Previous crisis-based research generates inconsistent findings. For instance, Lins et al. (2013) find that listed family-controlled companies underperformed during the 2008-2009 global financial crisis, particularly those with lower investment activity. However, there are also other studies that indicate that family firms showed better financial performance during the 1997/1998 Asian financial crisis (Amann & Jaussaud, 2011), the internet bubble (Bauweraerts, 2013), and the international crisis of 2008-2010 (Zhou et al., 2017). Zhou et al. (2017) point out that U.S. founder-led firms performed better than non-family firms during the financial crisis because of more cautious investment policies and better access to credit markets. Such founder firms demonstrated better operating performance because they had a lesser inclination to overinvest and their long-term orientation. The research implies that founder presence significantly enhances resilience; firms led by their founder invest less in uncertain projects and retain stronger reputational ties with lenders, facilitating better credit access during downturns (Zhou et al., 2017). Generally, economic shocks act as a stress test that amplifies both the strengths and weaknesses of organisational structures. For family firms, the combination of financial conservatism, relational capital, and long-term stewardship can serve as buffers during

such shocks. However, the absence of professionalisation or excessive control concentration can offset these advantages. Given these contrasting dynamics, the COVID-19 pandemic is a critical empirical setting to evaluate whether the strengths of family firms resulted in more stable financial performance compared with non-family firms during the crisis. Based on the literature discussed, the following hypotheses on the financial performance of family firms can be drawn:

Hypothesis 1 (H1): Family firms had a smaller decline Return on Equity (ROE) compared with non-family firms during the COVID-19 pandemic.

Hypothesis 2 (H2): Family firms had a smaller decline in Return on Assets (ROA) compared with non-family firms during the COVID-19 pandemic.

2.3 The Agency Theory

Agency Theory of Jensen and Meckling (1976) offers a valuable framework for analysing governance differences between family and non-family firms, especially under external shocks such as the COVID-19 pandemic. In family firms, where ownership and control are often concentrated within the same group, agency problems tend to revolve more around conflicts between majority family owners and minority shareholders (Morresi & Naccarato, 2016). This governance structure typically leads family firms to prioritise long-term stability and control over short-term financial performance (Anderson & Reeb, 2003). Such characteristics influence decisions around cost management, employment, and capital structure. Family firms are more likely to preserve control through concentrated ownership or mechanisms such as dual-class shares (Villalonga et al., 2015), which may result in a trade-off between efficiency and continuity. Some studies suggest that family firms rely more on debt to maintain control, benefiting from lower borrowing costs due to their close ties with financial institutions (Morresi & Naccarato, 2016). However, others argue that high debt levels may increase financial vulnerability (Mishra & McConaughy, 1999; Ampenberger et al., 2011). Nonetheless, the tendency of listed family firms to employ higher leverage is consistent with other studies in the field of finance research that rely on agency theory (King & Santor, 2008; Poletti-Hughes & Garcia, 2020). During economic downturns, these differences in governance become especially salient when firms encounter liquidity constraints and operational disruptions. COVID-19 forced firms to adapt their financial and operational strategies rapidly.

In non-family firms, where ownership and control are typically separated, managers may be more incentivised by short-term performance targets. This can result in more aggressive cost-cutting, downsizing, and reductions in capital investments to maintain profitability during a crisis. In contrast, family firms, driven by long-term orientation and greater alignment between ownership and control, may have been more willing to preserve employment and continue strategic investments to protect their long-term interests and socioemotional wealth. Ellul et al. (2018) provide cross-country evidence that family firms rely more on implicit contracts with employees, offering stronger employment protection, while this comes at the cost of lower average wages. Moreover, Tsoutsoura (2021) finds that family firms often substitute formal management systems with long-term relationships and implicit agreements, reinforcing their preference for employment stability over short-term optimisation. These findings suggest that family firms are more likely to retain employees during the crises, even when doing so entails short-term financial sacrifices. Furthermore, Morresi and Naccarato (2016) argue that the established relationships of family firms with creditors could have facilitated access to capital during the crisis, supporting employment retention and investments. According to Agency Theory, this alignment of interests fosters stronger commitments to internal stakeholders, such as employees, making family firms more inclined to avoid layoffs. Therefore, during the COVID-19 crisis, the difference in governance and incentive structures may have resulted in different employment strategies between family and non-family firms. The following hypotheses can be drawn regarding employment-related outcomes:

Hypothesis 3 (H3): Family firms laid off fewer employees relative to non-family firms during the COVID-19 pandemic.

Hypothesis 4 (H4): Family firms maintained higher average wages relative to non-family firms during the COVID-19 pandemic.

2.4 Capital Structure Theories

Capital structure decisions significantly affect a firm's financial health, particularly during periods of crisis such as the COVID-19 pandemic (Huang & Ye, 2021). Foundational work by Modigliani and Miller (1958) laid the groundwork for understanding capital structure by arguing that, under perfect market conditions, the choice between debt and equity is irrelevant for firm value. Later, Miller (1977) introduced important real-world considerations

such as taxes and bankruptcy costs, highlighting how debt can create both advantages and risks. These insights remain central to modern capital structure theory and are particularly relevant for family firms, which tend to favour more conservative financing strategies, especially in uncertain times. To better understand these strategic choices, this study draws on two key frameworks: Trade-Off Theory and Pecking Order Theory (POT).

The Trade-Off Theory offers a valuable lens for understanding how family firms manage their capital structure under stress. It suggests firms balance the tax advantages of debt against the risks of financial distress (Kraus & Litzenberger, 1973; Ju et al., 2005). This framework is particularly relevant for family firms, which are often more risk-averse than their non-family counterparts. Prior studies indicate that family firms tend to limit their use of debt to avoid jeopardising long-term control and survival (Mishra & McConaughy, 1999). Rather than maximising tax benefits through leverage, they often adopt more conservative financial strategies that emphasise stability over short-term returns (Jansen, 2022). The preferences reflect the importance of preserving family wealth and reducing exposure to bankruptcy risks. The COVID-19 crisis provided a real-world test of these financing behaviours. Firms with high leverage faced greater financial strain, while those with more conservative capital structures may have weathered the downturn more effectively. However, entirely avoiding debt may also have constrained the flexibility needed to invest or recover during the crisis. In this context, Trade-Off Theory helps explain why family firms may have responded differently to financial pressures during the pandemic and offers theoretical support for examining leverage outcomes in this study.

The Pecking Order Theory (POT) provides valuable insights into the financing preferences of family-owned firms. The theory posits that firms prefer internal financing, turning to debt only when necessary and using equity as a last resort due to concerns over information asymmetry and control dilution (Myers, 1984; Gama & Galvão, 2012). This hierarchy is particularly relevant for family firms, which often prioritise control preservation and risk aversion (Jansen et al., 2022). Empirical studies suggest that family firms tend to rely more on retained earnings and less on external capital markets, resulting in relatively conservative capital structures (Hamid et al., 2015; Baixauli-Soler et al., 2021). This aligns with their long-term orientation and desire to minimise financial exposure. Anderson, Mans, and Reeb (2003) argue that this approach also helps reduce agency conflicts between shareholders and creditors, further contributing to financial stability. Such cautious financial behaviour may have been advantageous during the COVID-19 crisis. Family firms, by limiting reliance on

external financing, may have been better positioned to withstand liquidity pressures and avoid financial distress (Zhou et al., 2017). However, this conservative approach, while promoting resilience, might limit their capacity to boost short-term profitability during crises. Both the Trade-Off Theory and POT suggest that family firms tend to adopt conservative financing strategies to preserve control and minimise financial distress. This cautious approach, while promoting resilience, might limit their capacity to boost short-term profitability during crises. If family firms prioritised employment retention as a strategic aim, it could have come at the expense of lower financial performance during the pandemic. Based on the discussion above, this research examines the following hypotheses:

Hypothesis 5 (H5): Family firms have lower levels of leverage compared with non-family firms.

Hypothesis 6 (H6): Family firms increased their leverage by less compared with non-family firms during the COVID-19 crisis.

Hypothesis 7 (H7): The difference in financial performance (ROE/ROA) of family firms versus non-family firms during the COVID-19 crisis is associated with differences in their employment retention and wage levels.

3. Data

This chapter outlines the data sources, sample construction, and variables used in this study. The first section describes the process of data collection and the criteria used to select the firms included in the sample. The second section explains how the key variables are defined, constructed, and calculated. Finally, the third section presents descriptive statistics to offer an overview of the dataset's key characteristics.

3.1 Data Source and Sample Collection

This research aims to measure whether there was a difference in performance between family and non-family firms during the COVID-19 pandemic. To examine this difference, a panel dataset of Dutch listed firms across multiple industries was compiled using financial data from ORBIS. Additionally, data related to ownership and whether a family member was also a member of the board of directors was gathered from annual reports and other publicly available filings. The initial dataset consisted of 129 companies, spanning the period from 2017 to 2023. With this sample period, the firm's performance before, during and after the COVID-19 pandemic is captured, allowing for a Difference-in-Difference (DiD) analysis. Public authorities, states, and governments are excluded from the dataset, as well as companies with no recent financial data. Moreover, firms with missing values for key variables (*ROE*, *ROA*, *log(Employees)*, *log(Wage)*) are also excluded from the sample.

After excluding 19 firms with no recent financial data or missing values for key variables or time frames, the final sample consists of 110 Firms, of which 37 (33.6%) are classified as family firms based on a minimum family ownership threshold of 20% of the voting rights together with a family member being on the Board of Directors or in a management position. The sample covers a broad range of industries, classified according to the NACE Rev 2 statistical classifications of economic activities, with the most representation in Research on experimental development on biotechnology (8.46%), manufacture of pharmaceutical preparations (3.85%), and manufacture of other special purpose machinery N.E.C. (3.85%).

Table 1*Description and Calculation of Variables*

This table gives a description and calculation/operationalisation of all the variables used in this research.

Variable	Description	Calculation/Operationalisation
<i>ROE</i> (%)	Return on Equity measures profitability relative to shareholders' equity.	Net income divided by shareholders' equity at year-end (in th EUR). Expressed in percentage points.
<i>ROA</i> (%)	Return on Assets measures profitability relative to total assets.	Net income divided by total assets at year-end (in th EUR). Expressed in percentage points.
<i>Log(Employees)</i>	Size of the workforce within the firm.	Natural logarithm of the number of employees.
<i>Log(Wage)</i>	Average wage level within the firm.	Natural logarithm of the total wage expense (in th EUR) divided by the number of employees.
<i>Log(Total Assets)</i>	Overall size of the firm.	Natural logarithm of total assets (in th EUR).
Leverage	Financial leverage.	Current liabilities and non-current liabilities divided by total assets (in th EUR).
Tobin's Q	Market value of the firm compared to its asset replacement cost.	Market capitalisation (stock price at year-end times the number of outstanding shares) divided by total assets (in th EUR).
Covid	Indicator for the COVID-19 period.	Dummy variable: 1 for the years 2020-2023, 0 for the pre-COVID period (2017-2019).
Family_Firm	Indicator of family ownership and involvement in governance.	Dummy variable: 1 if the family holds more than 20% of voting rights and has a board or management position, 0 otherwise.
Covid × Family	Interaction effect between family firms and COVID-19 period.	Product of the <i>Family Firm</i> and <i>Post</i> variables, used to estimate the Difference-in-Difference effect.

3.2 Variable Construction

3.2.1 Dependent variables

This research focuses on four main dependent variables to capture firm performance during the COVID-19 crisis: Return on Equity (*ROE* (%)), Return on Assets (*ROA* (%)), Employment ($\log(\text{Employees})$) and Wage ($\log(\text{Wage})$). *ROE* and *ROA* are used as measures of a firm's profitability, where *ROE* reflects its financial efficiency and *ROA* reflects its operational efficiency. *ROE* and *ROA* reflect the effectiveness with which a firm uses shareholders' assets and capital to make profits. It reflects differences in financial performance and is therefore relevant during periods of economic stress. In addition, to test *H5* and *H6*, Leverage will be modelled as a dependent variable.

As COVID-19 was not only an economic shock but also a human tragedy that adversely affected workers and labour markets worldwide (Schneider et al., 2024), employment and wage are relevant dependent variables to analyse. To measure performance in terms of workforce management, the variables employment and wage are used to examine external shocks. Since previous studies suggest family firms are more likely to retain jobs during crises because of reputational damage and stronger ties with stakeholders (Miller & Le Breton-Miller, 2005; Gómez-Mejía et al., 2023), employment is used as a proxy for social responsibility and internal human resources policies. As unadjusted employment and wage data will often be skewed when comparing across industries, the natural logarithm of the number of employees and wage is used. This normalises the distribution and allows for easier interpretation.

3.2.2 Independent variables

The main independent variable in this research is family involvement in the firm (*Family_Firm*). This is determined by two criteria that capture both ownership and involvement in management or governance. To be qualified as a family firm

1. A single family member or multiple family members together need to own at least 20% of a firm's voting rights (direct/indirect);
2. At least one family member must hold a position on the board of directors, serve as an executive, or be part of the senior management team.

In this way, not only is control in the sense of voting rights included, but also the active participation in operational or strategic decision-making. Table 2 provides a summary of the 37 firms identified as family firms in the sample, together with the basis for classification and the nature of family involvement. Complete background information, including ownership

percentages, board/management roles, and control chains, is documented in Appendix A for transparency.

Following Amore et al. (2022), ownership is measured using data from the year before the start of the COVID-19 pandemic (2019). This is known as the pre-treatment year and is used to avoid endogeneity issues. This ensures that the classification of a firm as a family firm is exogenous to the treatment, which is the COVID-19 shock in this case. Using ownership data from after the start of the crisis could bias the results, as families may have increased or decreased their stakes in reaction to the crisis. Since the estimation window spans from 2017 to 2023, anchoring the ownership classification in 2019 provides a consistent and pre-treatment measure.

Table 2

Family Firm Identification

This table presents an overview of all firms classified as family firms in this study. The first column lists the names of the firms, the second column outlines the basis for classification in terms of the ownership threshold, which is 20% of the voting rights or control structure, and the third column indicates family involvement through specific roles or evidence of active family influence. Complete background information, including control chains, is available in Appendix A.

Firm Name	Classification Basis	Family Involvement
1. Stellantis N.V.	Merged from FCA (Agnelli family, 28.98% through Exor N.V.) and Groupe PSA (Peugeot family)	John Elkann, chairman of the Board and great-great-grandson of Giovanni Agnelli.
2. LyondellBasell Industries N.V.	20.1% by Len Blavatnik via Access Industries.	Len Blavatnik, board member (non-executive director).
3. Heineken Holding N.V.	45.9% via L'Arche Green N.V., owned by Heineken family.	Charlene de Carvalho-Heineken. Board member.
4. Heineken N.V.	22.9% via Heineken Holding N.V., owned by Heineken family.	Charlene de Carvalho-Heineken. Member of the Supervisory Board.
5. CNH Industrial N.V.	42.5% via Exor N.V., owned by Agnelli family.	John Elkann, chairman.
6. IVECO Group N.V.	Business unit of CNH Industrial N.V. in 2019, controlled by Agnelli family through Exor N.V.	John Elkann, chairman.
7. Universal Music Group N.V.	25% via Vivendi S.A., owned by Bolloré Group (Bolloré family).	Yannick Bolloré, chairman.

8. Ferrovial S.E.	40.1% via multiple family holding entities (del Pino family).	Rafael and María del Pino, both board members.
9. Ferrari N.V.	35.4% via Exor N.V. by the Agnelli family.	John Elkann, Chairman.
10. OCI N.V.	50% via Sawiris family holdings.	Nassef Sawiris, CEO.
11. Ariston Holding N.V.	100% via holding companies of the Merloni family.	Paolo Merloni, executive chairman. Fransesco Merloni, honorary chairman.
12. Aalberts N.V.	20.5% by Jan Aalberts and family.	Jan Aalberts, founder and board member.
13. Davide Campari-Milano N.V.	51% via Lagfin S.C.A., the holding company of the Garavoglia family.	Luca and Alessandra Garavoglia, board members.
14. Sligro Food Group N.V.	34% via Slippens family holding.	Koen M. Slippens, CEO.
15. MFE-MediaForEurope N.V.	44.2% by Fininvest S.p.A., the holding company of Berlusconi family.	Pier Silvio Berlusconi, CEO. Marina Berlusconi, board member.
16. Redcare Pharmacy N.V.	26.4% by Köhler brothers.	Frank Köhler, member of supervisory board.
17. Digi Communications N.V.	53% by Zoltán Teszári, via RCS Management S.A.	Zoltán Teszári, president.
18. Cementir Holding N.V.	65.9% by Caltagirone family through holding company.	Fransesco Gaetano Caltagirone, chairman. Fransesco Caltagirone Jr, CEO..
19. Brunel International N.V.	60.1% by Jan Brand.	Jan Brand, founder and chairman of supervisory board.
20. Koninklijke Vopak N.V.	51% by Van der Vorm family through FortyTwo B.V., HAL Holding N.V., and HAL Investments B.V.	M. van der Vorm, board member of supervisory board.
21. Basic-Fit N.V.	20.3% by René Moos through AM Holding B.V.	René Moos, CEO.
22. CTP N.V.	100% by founder Remon Vos.	Remon Vos, CEO.
23. Astarta Holding N.V.	38.4% by Ivanchyk family through its holding.	Viktor Ivanchyk, CEO.
24. TomTom N.V.	25.3% combined ownership by married co-founders Goddijn and Vigreux.	Harold Goddijn, CEO. Corinne Vigreux, CCO.
25. CM.COM N.V.	50% by Jeroen van Glabbeek.	Jeroen van Glabbeek, CEO.
26. Cosmo Pharmaceuticals N.V.	35% by Maura Ajani via Cosmo Holding S.a r.l.	Maura S. Ajani, founder and chairman.

27. Hydratec Industries N.V.	69.9% by Ten Cate family via Ten Cate Investeringsmaatschappij B.V.	Egbert and Judith ten Cate, members of supervisory board.
28. Ebusco Holding N.V.	35.4% by Peter Bijvelds.	Peter Bijvelds, founder and CEO.
29. Fastned B.V.	50.7% of DRs held by Bart Lubbers via Wilhelmina-Dok B.V.	Bart Lubbers, co-founder.
30. AD Pepper Media Intl. N.V.	50.5% by Michael Oschmann.	Michael Oschmann, chairman of supervisory board.
31. NX Filtration N.V.	63.3% via Infestos and STAK controlled by B.H.F. ten Doeschot.	B.H.F. ten Doeschot, board member.
32. Ease2pay N.V.	24% by Jan Borghuis via TIOC v.o.f. and Morgen Beheer B.V.	Jan Borghuis, CEO.
33. Envipco Holding N.V.	52.9% by Alexandre Bouri via Megatrade SA.	Alexandre Bouri, founder and executive chairman.
34. Parx Materials N.V.	39.6% by co-founder Michaël van der Jagt.	Michaël van der Jagt, chairman.
35. DGB Group N.V.	25.8% voting rights by founder Selwyn Duijvestijn.	Selwyn A. M. Duijvestijn, founder and CEO.
36. Value8 N.V.	43.7% ownership by founder Peter-Paul Ferdinand de Vries.	Peter-Paul Ferdinand de Vries, founder and CEO.
37. Exor N.V.	100% owned by Agnelli family; 52% via Giovanni Agnelli B.V.	John Elkann, CEO.

3.2.3 Control variables

Several variables are included in this analysis which control for industry and firm-specific characteristics.

First, Industry is controlled for by including industry fixed effects based on the primary sector classification of the firm. This is done according to the NACE Rev. 2 codes, the Statistical Classification of Economic Activities in the European Community. This classification enables a standardised categorisation of firms across industries, ensuring that industry-specific differences are isolated from the effects of family ownership. Industry-specific differences are, for example, firms in the hospitality sector, which were more affected than firms in the technology sector. Industry fixed effects are included only in model specifications that do not control for firm fixed effects, as firm fixed effects already capture all time-invariant firm-specific characteristics, including industry classification.

Second, Firm Size is included as a control variable and is measured as the natural logarithm of total assets ($\log(\text{Total Assets})$). During the COVID-19 pandemic, independent of ownership structure, larger firms may have had more diversified operations or better access to financing, which potentially influences profitability and employment decisions.

Third, *Leverage* is included as a control variable to eliminate the differences in capital structure influencing firm performance outcomes. Firms with higher leverage may have faced greater financial constraints during the COVID-19 crisis, which could influence the adaptability and decision-making of firms. Leverage is measured as the ratio of current liabilities and non-current liabilities to total assets.

Fourth, *Tobin's Q* is the ratio between the market value of a company and the replacement costs of the firm's assets. It is included as a control variable to account for differences in market valuation and its growth opportunities, which may influence financial performance independently of family ownership. It is calculated by dividing the market value of the company by its total assets.

By using these control variables, the relationship between family involvement and firm performance during the COVID-19 pandemic can be measured more accurately, minimising potential omitted variable bias.

3.3 Descriptive Statistics

Table 3 presents the descriptive statistics for the main variables of the research. The average *ROE* is negative for both firm types, reflecting the financial stress during the sample period, though family firms show a less negative mean (-2.48%) compared with non-family firms (-6.71%). Similarly, the average *ROA* is higher for family firms (-1.45%) than for non-family firms (-4.36%). The standard deviations (SD) for both financial performance metrics are large, indicating high variability within both groups. Regarding the natural logarithm of the number of employees, family firms are slightly larger on average (mean = 7.41) compared with non-family firms (7.22), with a slightly higher dispersion. The natural logarithm of the average wage is slightly larger for non-family firms (mean = 1.86) compared with family firms (mean = 1.72). *ROE*, *ROA*, *Leverage*, and *Tobin's Q* data were winsorized due to the presence of extreme outliers. The unwinsorized descriptive statistics can be found in Appendix B, as well as descriptives by year and firm type.

Table 3*Descriptive Statistics for Main Variables*

This table shows the descriptive statistics for the main variables used in the analysis, reported separately for the full sample (770 observations), family firms (259 observations), and non-family firms (511 observations). *ROE*, *ROA*, *Leverage*, and *Tobin's Q* data were winsorized at the 1st and 99th percentile due to the presence of extreme outliers.

Variable	Full Sample (770 obs.)				
	Mean	SD	Median	Minimum	Max
ROE (%)	-5.25	46.01	6.32	-250.39	73.04
ROA (%)	-3.36	19.54	2.33	-88.04	26.36
Log(<i>Employees</i>)	7.29	2.97	7.77	0.00	13.55
Log(<i>Wage</i>)	1.81	0.50	1.85	-1.26	3.79
Log(<i>TotalAssets</i>)	13.80	2.78	14.16	0.00	19.22
Leverage	0.56	0.27	0.57	0.04	1.56
Tobin's Q	1.67	2.18	0.95	0.07	12.99
Family firms (259 obs.)					
ROE (%)	-2.48	42.44	6.36	-250.39	73.04
ROA (%)	-1.45	16.49	2.28	-88.04	26.36
Log(<i>Employees</i>)	7.41	3.21	8.32	0.00	13.6
Log(<i>Wage</i>)	1.72	0.62	1.80	-1.26	3.79
Log(<i>TotalAssets</i>)	13.96	3.22	14.51	0.00	19.22
Leverage	0.56	0.24	0.59	0.04	1.23
Tobin's Q	1.51	2.07	0.91	0.07	12.99
Non-family firms (511 obs.)					
ROE (%)	-6.71	47.76	6.14	-250.39	73.04
ROA (%)	-4.36	20.92	2.38	-88.04	26.36
Log(<i>Employees</i>)	7.22	2.83	7.43	0.00	13.5
Log(<i>Wage</i>)	1.86	0.42	1.89	-0.36	2.93
Log(<i>TotalAssets</i>)	13.72	2.52	14	7.02	19.16
Leverage	0.56	0.28	0.56	0.04	1.56
Tobin's Q	1.75	2.24	1.01	0.07	12.99

4. Methodology

This chapter outlines the empirical approach used to assess the differential impact of the COVID-19 crisis on family and non-family firms in the Netherlands. The analysis is structured to address the seven central hypotheses developed in the previous chapters and to provide a systematic test of the main research question. The chapter starts with an overview of the empirical strategy and main econometric models. Followed by additional features and the various robustness checks implemented to ensure the validity and reliability of the findings.

4.1 Empirical Strategy

The aim of this study is to investigate the differential impact of the COVID-19 crisis on family firms compared with non-family firms. A two-way fixed effects (TWFE) Difference-in-Difference (DiD) estimation approach is applied to quantitatively evaluate this difference. The DiD analysis facilitates causal inference by comparing changes in firm performance over time between the treatment group and the control group. The treatment group in this study consists of family firms, and the control group consists of non-family firms. This strategy is suitable for assessing the effects of an exogenous shock such as the COVID-19 pandemic, which provides a quasi-experimental setting. The TWFE specification controls for unobserved, time-invariant firm characteristics and common year-specific shocks, improving the credibility of the estimated treatment effects. The treatment period is defined as 2020 to 2023, with 2017 to 2019 serving as the pre-treatment period.

The baseline econometric model for this study is specified as follows:

$$Y_{it} = \beta_1(Covid_t \times Family_i) + \gamma'X_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{it} \quad (1)$$

Where:

- Y_{it} is an outcome variable of interest (ROE , ROA , $\log(Employees)$, or $\log(Wage)$).
- $Covid_t$ is a dummy equal to 1 during the treatment period (2020-2023);
- $Family_i$ is a dummy equal to 1 for family firms;
- X_{it} is a vector of lagged control variables;
- α_i and δ_t are firm and year fixed effects, respectively;
- ε_{it} is an error term.

The econometric model for *H1*, *H2*, *H3*, and *H4* is specified as follows:

$$Y_{i,t} = \beta_1(Covid_t \times Family_i) + \beta_2 Leverage_{i,t-1} + \beta_3 \log(TotalAssets)_{i,t-1} + \beta_4 Tobin's\ Q_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

The dependent variable $Y_{i,t}$ represents an outcome variable of interest for firm i in year t . The main dependent variables are return on equity (ROE), return on assets (ROA), the natural logarithm of employment ($\log(Employees)$) and the natural logarithm of the average wage ($\log(Wage)$). The variable $Family_i$ is a time-invariant binary dummy equal to 1 if a firm is classified as a family firm, and 0 otherwise. The $Covid_t$ variable is a binary time dummy equal to 1 during the COVID-19 period and afterwards (2020-2023), and 0 for the period leading up to the pandemic (2017-2019). The interaction term $Covid_t \times Family_i$ captures the different effect of the pandemic on family firms. The model includes three one-year lagged control variables: $Leverage_{i,t-1}$, $\log(TotalAssets)_{i,t-1}$, and $Tobin's\ Q_{i,t-1}$, which account for other factors that might influence ROE , ROA , $\log(Employees)$, or $\log(Wage)$, isolating the effect of the primary independent variable of interest. Firm fixed effects (α_i) and year fixed effects (δ_t) control for unobserved heterogeneity and macroeconomic shocks, respectively. The coefficient of interest, β_1 , identifies whether family firms experienced systematically different outcomes during the COVID-19 pandemic. This results in the following interpretation for *H1*: A positive and significant β_1 implies greater financial resilience in terms of ROE of family firms. For *H2*: A positive and significant β_1 implies greater financial resilience in terms of ROA of family firms. For *H3*: A positive and significant β_1 implies better employment retention for family firms. And for *H4*: A positive and significant β_1 implies better wage stability for family firms.

To assess if family firms have higher leverage compared with non-family firms (*H5*), the following econometric model is specified:

$$Leverage_{i,t} = \beta_1 FamilyFirm_i + \beta_2 ROA_{i,t-1} + \beta_3 \log(TotalAssets)_{i,t-1} + \beta_4 Tobin's\ Q_{i,t-1} + \gamma_j + \delta_t + \varepsilon_{i,t} \quad (3)$$

In this model (3), $Leverage_{i,t}$ is displayed as the dependent variable, rather than as a control variable, to test the fifth hypothesis. Here, $ROA_{i,t-1}$ is added as a one-year lagged control variable for profitability. Furthermore, $\log(TotalAssets)_{i,t-1}$ and $Tobin's\ Q_{i,t-1}$ are added to control for firm size and growth. In this specification, year (δ_t) and industry (γ_j) fixed effects are included and instead of year and firm fixed effects, because firm fixed effects would absorb the $FamilyFirm$ dummy, which is time-invariant and thus collinear with the firm-specific

intercepts. Moreover, leverage typically exhibits limited variation over time within firms, making firm fixed effects less informative and potentially increasing standard errors. By including industry fixed effects instead, the model captures structural differences in leverage across sectors, while still allowing the *FamilyFirm* coefficient to be estimated reliably. This results in the following interpretation: A negative and significant β_1 implies that Family Firms have less leverage compared with non-family firms.

To analyse if family firms changed their leverage ratio during the COVID-19 crisis compared with non-family firms (*H6*), the following econometric model is specified:

$$\begin{aligned} \text{Leverage}_{i,t} = & \beta_1(\text{Covid}_t \times \text{Family}_i) + \beta_2 \text{ROA}_{i,t-1} + \beta_3 \log(\text{TotalAssets})_{i,t-1} + \\ & \beta_4 \text{Tobin's } Q_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{i,t} \end{aligned} \quad (4)$$

In this model (4), $\text{Leverage}_{i,t}$ is the dependent variable, and the variable of interest is the interaction term $(\text{Covid}_t \times \text{Family}_i)$, which captures the different effect of the pandemic on family firms. $\text{ROA}_{i,t-1}$ is added as a one-year lagged control variable for profitability. Furthermore, $\log(\text{TotalAssets})_{i,t-1}$ and $\text{Tobin's } Q_{i,t-1}$ are added to control for firm size and growth. In this specification, year (δ_t) and firm (α_i) fixed effects are included. This results in the following interpretation for *H6*: A negative and significant β_1 implies a smaller increase in leverage by family firms.

To assess *H7*, a DiD model is used to examine whether the differences in financial performance of family firms during the COVID-19 crisis are associated with stronger employment retention and wage stability in family firms. This is done by estimating two sets of models. The first set uses financial performance indicators (*ROE* and *ROA*) as dependent variables. The second set examines employment outcomes, using $\log(\text{Employees})$ and $\log(\text{Wage})$ as dependent variables. Both models include the interaction term $\text{Covid}_t \times \text{Family}_i$, one-year lagged control variables, as well as firm and year fixed effects. If the coefficient of interest is positive and statistically significant in both financial and employment-related regressions, this would indicate that family firms experienced both better financial outcomes and higher employment retention and/or wage stability during the pandemic. Such findings would support *H5* by showing that the financial performance gap may be partly associated with differences in how family firms preserved employment and wages in times of the COVID-19 crisis.

4.2 Additional Features

To ensure the reliability of the estimated treatment effects, several additional features are implemented. First, the *ROE*, *ROA*, *Leverage*, and *Tobin's Q* variables are winsorized at the 1st and 99th percentiles to minimise the effect of extreme outliers, which could otherwise bias the results. Winsorization helps address potential measurement errors or firm-specific anomalies. The procedure was not applied to the logarithm of the number of employees and total assets since the transformation already reduces the effect of skewed values. Similarly, binary family firm classification is not susceptible to outliers.

Second, following Volpin (2002), standard errors are clustered at the firm level to account for serial correlation within firms over time. This method produces more conservative and reliable inference.

Third, the estimation window spans from 2017 to 2023, providing a wide foundation to establish a pre-treatment baseline and assess both the immediate and longer-term effects of the COVID-19 shock. This extended period strengthens the DiD framework by reducing the likelihood that the estimated treatment effect is driven by short-term volatility or unrelated external events. Here, j denotes the industry a firm belongs to.

Fourth, visual and statistical pre-treatment trend analyses are conducted to verify the validity of the parallel trends assumption, a crucial requirement for the validity of the DiD design.

Finally, lagged control variables are included to address concerns of endogeneity and reverse causality. The main regressions use one-year lagged control variables to strengthen the credibility of the results. Using lagged values helps ensure that firm characteristics are predetermined and not influenced by contemporaneous outcomes. Additionally, a Pearson correlation matrix and Variance Inflation Factor (VIF) analysis are conducted to test for multicollinearity among the independent variables. These robustness checks in total enhance the internal validity of the findings.

4.3 Robustness Tests

To ensure the reliability of the results, several robustness checks are conducted. The main regressions are repeated using alternative definitions of family firm ownership. Family firms are redefined based on either a minimum of 10% or 30% of the voting rights. These thresholds test whether the results are sensitive to broader or stricter definitions of family control. Importantly, under the 10% threshold, the criterion that a family member holds an

executive or board position is dropped. This allows for the inclusion of firms with family ownership but without formal family involvement in management or governance, thereby testing whether ownership alone is associated with different outcomes. For the 30% threshold, the removal of the board or executive criterion does not change the sample, as all firms with at least 30% family ownership also have a family in such a position. Together, these robustness checks demonstrate that the main findings are not driven by a particular definition of family firm.

5. Results

This chapter analyses the main empirical findings of the research. All data analyses were conducted using RStudio. The chapter begins with validating the parallel trends assumption, which is visually inspected and formally tested using pre-treatment interaction terms. Next, *H1*, *H2*, *H3*, and *H4* are tested by estimating DiD regressions, which are performed twice each, once without control variables and once with control variables. *H5* and *H6* are tested using an OLS regression with *Leverage* as the dependent variable. *H7* is addressed by comparing the interaction effects from the financial performance regressions and the employment-related regressions. Finally, robustness checks are performed to validate the reliability of the results. These include repetition of the main regressions with lagged control variables and tests for multicollinearity.

5.1 The Parallel Trends Assumption

Figure 1 illustrates the yearly trends in *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{Wage})$ for non-family and family firms over the 2017-2023 period. The figure gives an initial visual estimation of the data and helps to contextualise the subsequent regression analyses. The vertical dashed line and shaded area denote the onset of the COVID-19 crisis in 2020.

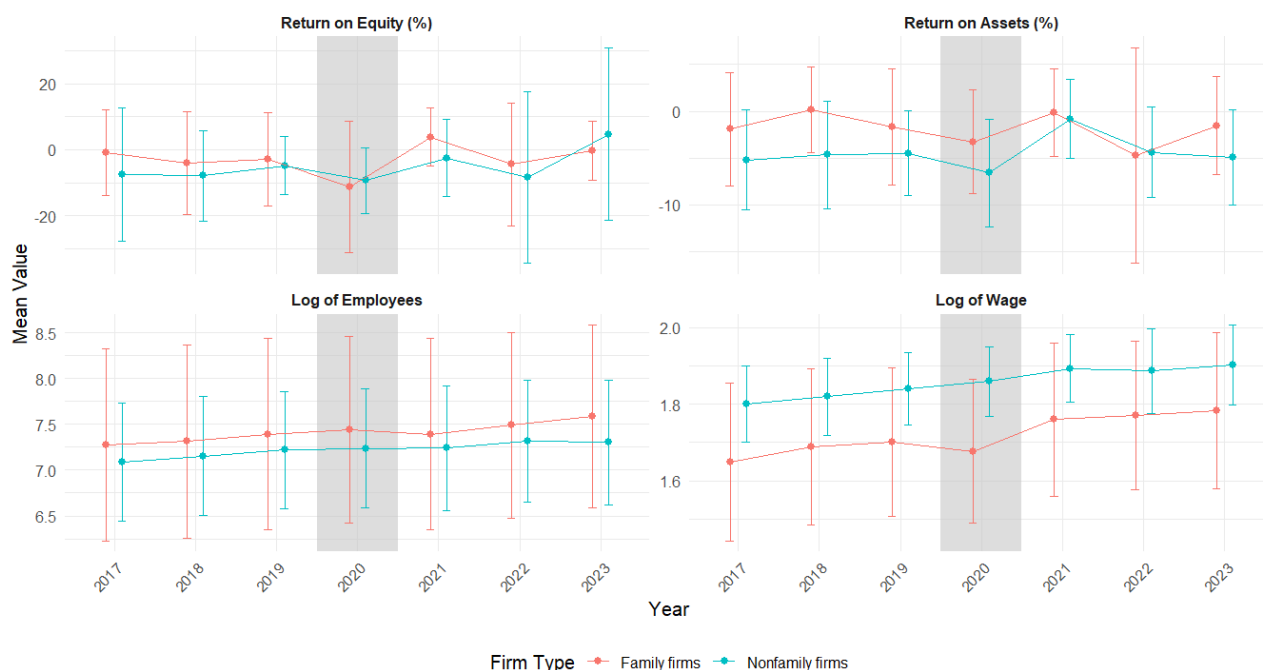
ROE and *ROA* show a noticeable decline in 2020 for both firm types, coinciding with the outbreak of the pandemic. This decrease is especially visible in *ROE*, suggesting that firm profitability was severely affected during the initial shock. However, in the years following the onset of the crisis, family firms show a relatively quicker and stronger recovery in both *ROE* and *ROA* compared with non-family firms. While both firm types were negatively impacted, the recovery trajectories indicate a potential advantage in resilience for family-controlled firms. The employment trend appears relatively stable over time, while the logarithm of wages slightly declines for family firms. There is not a substantial drop in 2020, which shows that companies generally maintained their workforce levels throughout the sample period. To validate the DiD approach, the parallel trends assumption needs to hold. So, in the absence of treatment, the treatment and control group would have followed similar outcome trajectories over time. Based on Figure 2, the pre-treatment period (2017-2019) shows broadly parallel trends for *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{Wage})$ with no evidence of diverging trajectories before the COVID-19 shock. This supports the assumption that both groups would have evolved similarly in the absence of the pandemic. Appendix C shows a formal testing of the parallel trends assumption with no statistically significant values for the interaction terms in the pre-treatment years.

Error bars in the figure represent 95% confidence intervals of the yearly means. Overlapping confidence intervals suggest that while there are apparent differences, variation in mean results should be interpreted cautiously without formal statistical testing. Overall, the descriptive trends suggest possible differences in firm behaviour in resilience between non-family and family firms during the COVID-19 pandemic.

Figure 1

Trends in Firm Performance and Employment

This figure displays the yearly trends in *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{Wage})$ for family firms (red line) versus non-family firms (blue line) for the period of 2017-2023. The shaded area indicates the onset of the COVID-19 crisis (year 2020). Error bars represent 95% confidence intervals of the yearly means.



5.2 Regression Analyses

5.2.1 Financial Performance

To test whether family firms experienced a smaller decline in financial performance compared with non-family firms during COVID-19 (*H1* and *H2*), an OLS regression is performed twice to estimate the magnitude of the interaction term: first, without added control variables (Table 4), and second, with the added control variables (Table 5). The results of the first regression are shown in Table 4. The coefficient of interest, *Covid* $\times$ *Family*, captures the differential impact of the crisis on family firms relative to non-family firms. The positive and statistically insignificant coefficients in both models (4.93 and 3.51, respectively) suggest that family firms experienced a smaller decline in financial performance during the pandemic. However, the effect is not statistically significant at conventional levels. Year and firm fixed effects are included but not displayed. The models explain a weak part of the variation in financial performance, with Adjusted R-squared values of 0.30 for the *ROE*-model and 0.44 for the *ROA*-model.

Table 4

Regression Results for ROE and ROA

This table shows the results from two DiD regressions examining the impact of the COVID-19 crisis on financial performance for non-family versus family firms. The dependent variables are *ROE* in column (1) and *ROA* in column (2). The models include year and firm fixed effects and are estimated using standard errors clustered at the firm level. The variables *Covid* and *Family_Firm* are omitted from this model because of perfect multicollinearity with the year and firm fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variable	ROE (1)	ROA (2)
<i>Covid</i> $\times$ <i>Family</i>	4.93 (7.56)	3.51 (3.64)
Observations	770	770
R ²	.37	.50
Adjusted R ²	.30	.44

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

Secondly, the three one-year lagged control variables are added to the model, and the results are shown in Table 5. The main coefficient of interest, *Covid* $\times$ *Family*, is statistically insignificant for both *ROE* and *ROA* with values of 2.59 and -0.71, respectively. This suggests that family firms did not experience a significantly different change in financial performance during the pandemic period compared with non-family firms when control variables are

included. Among the control variables, there is no statistically significant association with either ROE or ROA. The inclusion of lagged control variables improves the explanatory power of the models, with adjusted R-squared values of 0.48 for ROE and 0.73 for ROA, indicating moderate model fit.

Table 5

Regression Result for ROE and ROA

Table 5 presents the results of the two DiD regressions examining the effect of the COVID-19 pandemic on financial performance, measured by ROE in column 1 and ROA in column 2, for family firms compared with non-family firms, including a set of one-year lagged control variables. 110 observations are dropped due to the lagged control variables. The variables *Covid* and *Family_Firm* are omitted from this model because of perfect multicollinearity with the year and firm fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variables	ROE (1)	ROA (2)
Covid × Family	2.59 (6.57)	-.71 (2.28)
Leverage	6.02 (8.58)	3.42 (4.14)
Log(<i>TotalAssets</i>)	-1.92 (3.96)	1.25 (1.75)
Tobin's Q	-1.34 (2.93)	-.24 (.46)
Observations	660	660
R ²	.58	.78
Adjusted R ²	.48	.73

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

These findings suggest that, after controlling for firm-specific characteristics and fixed effects, there is no evidence that family firms performed significantly better or worse than non-family firms in terms of profitability during the COVID-19 pandemic.

5.2.2 Employment Retention and Wage Stability

To test whether family firms laid off fewer employees and maintained higher average wages compared with non-family firms during the COVID-19 pandemic (*H3* and *H4*), an OLS regression is performed twice to estimate the magnitude of the interaction term: first, without control variables (Table 6), and second, with the added control variables (Table 7). In the first

regressions without control variables, the variable of interest, $Covid \times Family$, captures the differential effect of the pandemic on family firms relative to non-family firms. The coefficients are positive but statistically insignificant for both models, indicating that although family firms may have experienced a smaller decline in employment or wage levels during the crisis compared with non-family firms, this effect is not statistically different from zero. Model 1 explains a moderate amount of the variation in employment with an adjusted R-squared of 0.50. Model 2 explains a substantial portion of the variation in $\log(Wage)$ with an adjusted R-squared value of 0.86.

Table 6

Regression Results for Log(Employees) and Log(Wage)

This table presents the results of the DiD regression examining the impact of the COVID-19 crisis on the logarithm of employment (column 1) and wage (column 2). $Covid \times Family$ is the interaction term for family firms during the COVID-19 period. The model includes firm and year fixed effects. The variables $Covid$ and $Family_Firm$ are omitted from this model because of perfect multicollinearity with the year and firm fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variable	Log(Employees) (1)	Log(Wage) (2)
$Covid \times Family$	.69 (.44)	.002 (.06)
Observations	770	770
R ²	.55	.88
Adjusted R ²	.50	.86

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

After adding one year lagged control variables to the model, the coefficient for the interaction term $Covid \times Family$ is positive but still statistically insignificant for both $\log(Employees)$ and $\log(Wage)$ (0.01), suggesting that family firms did not experience a significantly different change in employment or wage levels during the pandemic compared with non-family firms. Among the control variables, $\log(Total\ Assets)$ is both positive and highly significant ($p < 0.001$) in Model 1, implying that larger firms (in terms of total assets) tend to employ more workers. *Leverage* and *Tobin's Q* are not statistically significant in both models, which indicates no meaningful relationship with employment or wage levels. The models explain a large portion of the variation in the dependent variable, with an R-squared of 0.97 and an adjusted R-squared of 0.96 in model 1 and an R-squared of 0.89 and an adjusted R-squared of 0.87 in model 2, indicating a substantial overall fit of the models.

Table 7*Regression Results for Log(Employees) and Log(Wage) with Control Variables*

This table presents the results of two DiD regressions examining the impact of the COVID-19 crisis on employment and wages. Employment is measured as the natural logarithm of the number of employees, and wage is measured as the natural logarithm of the average wage. The model includes firm and year fixed effects as well as one-year lagged control variables (*Leverage*, $\log(\text{Total Assets})$, *Tobin's Q*), with standard errors clustered at the firm level and shown in parentheses. 110 observations are dropped due to the lagged control variables. The variables *Covid* and *Family_Firm* are omitted from this model because of perfect multicollinearity with the year and firm fixed effects.

Variable	Log(Employees) (1)	Log(Wage) (2)
Covid × Family	.10 (.14)	.01 (.05)
Leverage	.36 (.25)	-.09 (.10)
Log(<i>TotalAssets</i>)	.55*** (.15)	.03 (.04)
Tobin's Q	.03 (.03)	-.01 .01
Observations	660	660
R ²	.97	.89
Adjusted R ²	.96	.87

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

These findings suggest that, after controlling for firm-specific characteristics and fixed effects, there is no evidence that family firms performed significantly better or worse than non-family firms in terms of employment-related outcomes during the COVID-19 pandemic.

5.2.3 Leverage

To test whether family firms have lower leverage levels compared with non-family firms (*H5*), an OLS regression is conducted using leverage as the dependent variable and *FamilyFirm* as the key explanatory variable. Table 8 presents the results of this regression. The coefficient of the variable *Family_Firm* is -0.09 and statistically significant at the 1% level ($p < 0.01$). This indicates that, on average, family firms exhibit a significantly lower leverage ratio compared with non-family firms, controlling for industry and year fixed effects. The control variables $\log(\text{TotalAssets})$ and *ROA* are both significant at the 1% level ($p < 0.001$), indicating that larger firms, in terms of total assets, have higher leverage ratios on average, and firms with a higher *ROA* have lower leverage ratios, on average. The model explains 39% of the variation in *leverage*, as indicated by the adjusted R-squared value of 0.39, suggesting a weak model fit. Overall, the table supports the hypothesis that family firms rely less on debt.

Table 8

Regression Results for Leverage

This table shows the regression results for *Leverage*. *Family_Firm* is a dummy variable that equals 1 for firms classified as family firms. $\log(\text{TotalAssets})$ represents the natural logarithm of total assets, while a one-year lagged control variable for firm size is included. Additionally, *ROA* and *Tobin's Q* are included as one-year lagged control variables for profitability and growth, respectively. 110 observations are dropped due to the lagged control variables. Industry and year fixed effects included. Standard errors are clustered at the firm level and shown in parentheses. *Covid* is omitted from the model because of perfect multicollinearity with the year fixed effects.

Variables	Leverage (1)
Family_Firm	-.09** (0.04)
$\log(\text{TotalAssets})$	.03*** (.003)
ROA	-.01*** (.001)
Tobin's Q	-.01 (.01)
Observations	660
R ²	.46
Adjusted R ²	.39

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

To test whether family firms increased their leverage by less during the COVID-19 crisis (*H6*), a DiD approach is applied using an interaction term, $Covid \times Family$. Table 9 shows the results of the baseline regression without control variables. The coefficient on $Covid \times Family$ is -0.04, suggesting a smaller increase in leverage among family firms. However, the result is statistically insignificant ($SE = 0.02$), meaning there is no reliable evidence of a differential effect. The model explains a moderate amount of the variation in employment with an adjusted R-squared of 0.57.

Table 9

Regression Results for Leverage

This table shows the results of the DiD regression examining the impact of the COVID-19 crisis on the leverage levels of firms. $Covid \times Family$ is the interaction term for family firms during the COVID-19 period. The model includes firm and year fixed effects. The variables *Covid* and *Family_Firm* are omitted from this model because of perfect multicollinearity with the year and firm fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variable	Leverage (1)
$Covid \times Family$	-.04 (.02)
Observations	770
R ²	.67
Adjusted R ²	.57

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

After adding one-year lagged control variables to the model, the coefficient for the interaction term $Covid \times Family$ is positive but still statistically insignificant, suggesting that family firms did not experience a significantly different change in leverage levels during the pandemic compared with non-family firms. Among the control variables, *ROA* is negative and statistically significant ($p < 0.05$), indicating that more profitable firms tend to have lower levels of leverage. $Log(TotalAssets)$ and *Tobin's Q* are not statistically significant in the model, which indicates no meaningful relationship with leverage levels. The model explains a moderate amount of the variation in *leverage*, with an R-squared of 0.70 and an adjusted R-squared of 0.58.

Table 10*Regression Results for Leverage*

This table shows the results of the DiD regression examining the impact of the COVID-19 crisis on the leverage levels of firms. $Covid \times Family$ is the interaction term for family firms during the COVID-19 period. $\text{Log}(TotalAssets)$ is the natural logarithm of total assets, a one-year lagged control variable for firm size. ROA and $Tobin's Q$ are included as one-year lagged control variables for profitability and growth, respectively. 110 observations are dropped due to the lagged control variables. The variables $Covid$ and $Family_Firm$ are omitted from this model because of perfect multicollinearity with the year and firm fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variables	Leverage (1)
$Covid \times Family$	.01 (.04)
$\text{Log}(TotalAssets)$	.01 (.03)
ROA	-.002* (.001)
$Tobin's Q$	-.01 (.01)
Observations	660
R^2	.70
Adjusted R^2	.58

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

5.2.4 Financial Offer for Job Retention

To test whether the difference in financial performance between family firms and non-family firms during the COVID-19 crisis is associated with a difference in their employment retention or wage levels (*H7*), the results of the first and second regressions are compared, corresponding to *H1* and *H2*. Table 11 shows the interaction term *Covid* $\times$ *FamilyFirm* coefficients across the main regressions for *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{Wage})$, corresponding to *H1* and *H2*. The results indicate that family firms achieved a higher *ROE*(2.59) compared with non-family firms during the COVID-19 period. However, this estimate is not statistically significant due to its large standard error (6.57). In contrast, *ROA* is slightly lower for family firms (-0.71), with a smaller standard error (2.28), but remains statistically insignificant. Importantly, the positive and small coefficients for $\log(\text{Employees})$ (0.10) and $\log(\text{Wage})$ (0.01), both with relatively small standard errors, suggest that family firms retained slightly more employees and paid marginally higher wages on average during the pandemic however, these results are also statistically insignificant.

In addition to comparing the regression results directly, a mediation-style DiD approach is employed to formally test whether employment retention mediates the relationship between family ownership and financial performance during the COVID-19 period. However, the mediation effects are not statistically significant. The detailed results of this analysis are presented in Appendix C.

Table 11

Estimated Coefficients of Interaction Term Across Main Regressions

This table shows the interaction term *Covid* $\times$ *FamilyFirm* coefficients across the main regressions for *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{Wage})$, corresponding to *H1* and *H2*. All regressions include firm and year fixed effects. Standard errors are clustered at the firm level and shown in parentheses.

Variable	ROE (<i>H1</i>)	ROA (<i>H2</i>)	Log(Employees) (<i>H3</i>)	Log(Wage) (<i>H4</i>)
Covid $\times$ FamilyFirm	2.59 (6.57)	-0.71 (2.28)	0.10 (0.14)	0.01 (0.05)
Observations	660	660	660	660
R ²	0.58	0.78	0.97	0.89
Adjusted R ²	0.48	0.73	0.96	0.87

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

5.3 Robustness Tests

To test the robustness of the OLS regression results, additional regressions are performed using alternative definitions of family firms based on ownership thresholds. The main regressions were re-estimated using 30% and 10% ownership thresholds in terms of voting rights. The results are presented in Appendix D. Lowering the threshold to 10% increased the number of family firms to 47, while raising it to 30% reduced the number to 30. Across all specifications, the coefficients on the interaction terms for the 30% threshold ($Covid \times FamilyFirm30$) and for the 20% threshold ($Covid \times FamilyFirm10$) remain statistically insignificant and consistent in direction and magnitude with the baseline models in Tables 5, 7, and 10. This applies both to financial performance (ROE and ROA) and employment-related outcomes ($\log(Employees)$ and $\log(Wage)$). For example, the coefficient $Covid \times FamilyFirm30$ on ROE is 6.43 (SE = 6.87), and for $Covid \times FamilyFirm10$ it is 7.65 (SE = 6.60), which are comparable to the main regression estimate of 2.59 (SE = 6.57). Similar patterns are observed for ROA , $\log(Employees)$, and $\log(Wage)$. However, regarding leverage, the robustness test confirms the main finding that family firms tend to operate with significantly lower leverage. Under the 10% definition, the coefficient is larger in magnitude and highly significant (-0.13, $p < 0.001$), suggesting a more conservative capital structure at lower thresholds of family control. The 30% definition also yields a significant negative coefficient (-0.10, $p < 0.05$), reinforcing the inverse relationship between family ownership and leverage. These robustness checks confirm that the results do not materially depend on the exact ownership threshold used to define family firms. While slight variations in coefficient sizes are observed, the general conclusions regarding the lack of statistically significant differences between family and non-family firms during the COVID-19 period remain unchanged.

Additionally, a Pearson correlation matrix and Variance Inflation Factor (VIF) analysis are conducted to test for multicollinearity among the independent variables. Due to the high correlation ($r = 0.87$) between $\log(Employees)$ and $\log(TotalAssets)$, models including both may suffer from multicollinearity. To mitigate multicollinearity, only one at a time is included in the main regressions. All other VIF scores were below the conventional threshold of 10, indicating that multicollinearity is not a concern for the estimated models (see Appendix D for the full VIF output and scatterplot).

Overall, the empirical analysis finds no significant evidence that family firms outperformed non-family firms during the COVID-19 crisis, nor that they retained more employees or paid higher wages on average. These findings remain consistent across multiple definitions of family ownership and various robustness tests.

6. Conclusion and Discussion

This thesis experimentally tested the extent to which Dutch family firms showed higher resilience during the COVID-19 pandemic compared with non-family firms. Using a Difference-in-Difference methodology, the research compared differences in financial performance, measured by Return on Equity and Return on Assets, and employment retention, proxied by $\log(\text{Employees})$ and $\log(\text{Wage})$, over the 2017-2023 period. The empirical analysis is based on firm-level panel data derived from Orbis, complemented by manually gathered ownership and board member information.

6.1 Theoretical and Empirical Contributions

Seven hypotheses were formulated to assess the differences in financial and employment-related outcomes between family and non-family firms. *H1* and *H2* suggest that family firms had a smaller decline in financial performance in terms of *ROE* and *ROA* compared with non-family firms during the COVID-19 pandemic. Although the interaction term *Covid* $\times$ *Family* is consistently positive for *ROE*, none of the coefficients are statistically significant. Similarly, for *ROA*, the estimates are small and even slightly negative in some specifications, while being statistically insignificant.

Hypotheses 3 and 4 (*H3*, *H4*) propose that family firms laid off fewer employees and maintained higher average wages relative to non-family firms during the COVID-19 period. These hypotheses also do not receive empirical support. The regression estimates for both $\log(\text{Employees})$ and $\log(\text{Wage})$ show small positive coefficients, but neither reach statistical significance at the 0.05 level.

In contrast, Hypothesis 5 (*H5*) does receive empirical support. The analysis reveals that family firms exhibit significantly lower leverage ratios compared with non-family firms. This outcome suggests that family firms adopt more conservative financing policies. These findings are consistent with studies arguing that family firms are more risk-averse and prefer to limit financial distress by relying less on debt (Mishra & McConaughy, 1999; Ampenberger et al., 2011). It contrasts with literature suggesting that family firms use leverage strategically to maintain control (Morresi & Naccarato, 2016; King & Santor, 2008), indicating that listed Dutch family firms prioritise financial stability over control-enhancing debt usage. While family firms exhibit significantly lower leverage levels overall, there is not statistically significant evidence that they adjusted their leverage differently from non-family firms during the COVID-19 crisis (*H6*).

Hypothesis 7 (*H7*) posits that the difference in financial performance (*ROE/ROA*) of family firms versus non-family firms during the COVID-19 crisis is associated with differences in their employment retention and wage levels. This hypothesis is tested by comparing the coefficients of the regressions related to *H1*, *H2*, *H3* and *H4*, and through a mediation-style DiD model. Again, no statistically significant mediation effects were observed, suggesting that there is no substantial evidence to support the idea that better employment outcomes among family firms explain any differences in financial performance.

Several robustness checks were conducted to validate the reliability of the findings. These comprised different definitions of family firms, applying ownership cut-offs at 10% and 30%, omitting the board member criterion. None of these alternative specifications yielded substantially different results, reinforcing the conclusion that the observed differences between family and non-family firms are not statistically significant, except for leverage. Furthermore, multicollinearity checks revealed that the independent variables used were generally appropriate, although $\log(\text{Employees})$ and $\log(\text{TotalAssets})$ showed a high correlation and were therefore included separately in different models.

Overall, the findings suggest that Dutch family firms did not significantly outperform non-family firms during the COVID-19 crisis, either in terms of financial performance or employment retention. These results contrast with some of the previous literature that highlights the long-term orientation and stakeholder commitment of family firms as potential sources of resilience (Anderson & Reeb, 2003; Zhou et al., 2017). However, the significantly lower leverage among family firms aligns with capital structure theories suggesting financial conservatism and risk aversion (Mishra & McConaughy, 1999; Ampenberger et al., 2011; Baixauli-Soler., 2021). Moreover, the analysis reveals that leverage levels did not change significantly during the COVID-19 crisis. From a practical standpoint, these results suggest that ownership structure is not a reliable predictor of corporate resilience in a crisis context. Policymakers and investors should therefore be cautious in assuming superior crisis performance among family firms without considering additional governance or strategic variables.

6.2 Limitations and Recommendations for Future Research

This thesis contributes to the existing literature by conducting a comprehensive investigation into the crisis performance of Dutch family firms during the COVID-19 pandemic. By combining a Difference-in-Difference estimation strategy with a carefully

constructed dataset that captures both ownership and governance characteristics, this study provides an empirical assessment of whether family firms displayed greater resilience than their non-family counterparts. The inclusion of employment-related outcomes, alongside financial indicators, further broadens the scope of the analysis and allows for a more nuanced understanding of resilience beyond profitability alone.

However, there are some potential limitations to consider. Firstly, the definition of family firms relies on ownership and management/board representation, which may not fully capture the extent of family influence. The classification of family firms is inherently complex and subject to interpretation. Although this study applies a dual criterion based on ownership and governance involvement, family influence may manifest in more subtle or informal ways that are not captured by these metrics. Secondly, the analysis is restricted to listed Dutch firms, which limits its generalizability to smaller private firms or to firms in countries with different institutional or legal environments. Family firms in emerging markets or in countries with weaker investor protections, for instance, may behave differently under crisis conditions. Thirdly, the study focuses on accounting-based performance and employment outcomes. Other more qualitative dimensions, such as leadership style, strategic decisions, customer retention or innovation, were not included.

Based on the limitations mentioned, the following recommendations are proposed for future research on this topic. Further research could investigate the role of informal family influence by exploring alternative mechanisms through which family firms may exhibit resilience, such as access to private funding, strategic agility, or the presence of founders. Second, a cross-country comparison could provide deeper insights into how institutional factors moderate the impact of family ownership during crises. Third, future research may benefit from combining quantitative panel data with qualitative case studies or interviews to explore how family firms internally manage uncertainty, make decisions under pressure, or balance short-term sacrifices with long-term goals. Additionally, including other outcome dimensions, such as R&D investment, customer retention, or ESG-related performance, could reveal different channels through which resilience is expressed. Finally, given that the economic effects of COVID-19 extended beyond 2023 for some industries, a longer time horizon could help capture delayed or nonlinear recovery patterns across ownership types.

Usage of AI

For this research, the use of AI tools, such as ChatGPT, was in line with Tilburg University's AI policy for the MSc Finance program. ChatGPT and Grammarly were used for final grammar checks, where I carefully reviewed each suggestion. Additionally, it was used to assist with programming in R by clarifying coding errors and offering minor suggestions to resolve issues, after critically assessing the suggestions. I confirm that no AI tools were used to generate ideas, interpret tables, draw conclusions, or gather data in this study. I take full responsibility for the content and findings presented in this research.

References

- Amann, B., & Jaussaud, J. (2011). Family and non-family business resilience in an economic downturn. *Asia Pacific Business Review*, 18(2), 203–223.
- Ampenberger, M., Schmid, T., Achleitner, A., & Kaserer, C. (2011). Capital structure decisions in family firms: empirical evidence from a bank-based economy. *Review Of Managerial Science*, 7(3), 247–275.
- Amore, M. D., Pelucco, V., & Quarato, F. (2022). Family ownership during the Covid-19 pandemic. *Journal of Banking & Finance*, 135, 106385.
- Anderson, Ronald C. and Reeb, David M., (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance*, 58(3), 1301–1328.
- 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.
- Baixauli-Soler, J. S., Belda-Ruiz, M., & Sánchez-Marín, G. (2020). Socioemotional wealth and financial decisions in private family SMEs. *Journal of Business Research*, 123, 657–668.
- Bauweraerts, J. (2013). How Do Private Family Firms Face the Crisis? Empirical Evidence from Belgium. *International Business Research*, 6(8).
- Bertrand, M., & Schoar, A. (2006). The role of family in family firms. *The Journal of Economic Perspectives*, 20(2), 73–96.
- Ellul, A., Pagano, M., & Schivardi, F. (2018). Employment and Wage Insurance within Firms: Worldwide Evidence. *The Review of Financial Studies*, 31(4), 1298-1340
- Faccio, M., & Lang, L. H. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, 65(3), 365–395.
- Gama, A. P. M., & Galvão, J. M. M. (2012). Performance, valuation and capital structure: survey of family firms. *Corporate Governance*, 12(2), 199–214.
- 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>
- Hamid, M. A., Abdullah, A., & Kamaruzzaman, N. A. (2015). Capital structure and profitability in Family and Non-Family Firms: Malaysian evidence. *Procedia Economics and Finance*, 31, 44–55.

- Heino, N., Alimov, N., & Tuominen, P. (2024). Family firm employment behaviour during a financial crisis: Does generational stage matter? *Journal of Family Business Strategy*, 15(3), 100624.
- Huang, H., & Ye, Y. (2021). Rethinking capital structure decision and corporate social responsibility in response to COVID-19. *Accounting And Finance*, 61(3), 4757–4788.
- Jansen, K., Michiels, A., Voordeckers, W., & Steijvers, T. (2022). Financing decisions in private family firms: a family firm pecking order. *Small Business Economics*, 61(2), 495–515.
- Jaskiewicz, P., Uhlenbruck, K., Balkin, D. B., & Reay, T. (2013). Is nepotism good or bad? Types of nepotism and implications for knowledge management. *Family Business Review*, 26(2), 121–139.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Ju, N., Parrino, R., Potoshman, A. M., & Weisbach, M. S. (2005). Horses and Rabbits? Trade-Off Theory and Optimal Capital Structure. *Journal of Financial and Quantitative Analysis*, 40(2), 259–281.
- King, M. R., & Santor, E. (2008). Family values: Ownership structure, performance, and capital structure of Canadian firms. *Journal of Banking & Finance*, 32(11), 2423–2432.
- Kraus, A., & Litzenberger, R. H. (1973). A State-Preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911.
- La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance*, 54(2), 471–517.
- 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.
- Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of Corporate Finance*, 12(2), 321–341.
- Miller, D., & Le Breton-Miller, I. (2005). Managing for the long run: Lessons in competitive advantage from great family businesses. In D. Miller, & I. Le Breton-Miller, Managing for the long run: Lessons in competitive advantage from great family businesses. Boston, Massachusetts: Harvard Business Press
- Miller, M. H. (1977). Debt and Taxes. *The Journal of Finance*, 32(2), 261–275.

- Mishra, C. S., & McConaughy, D. L. (1999). Founding family control and capital structure: the risk of loss of control and the aversion to debt. *Entrepreneurship Theory and Practice*, 23(4), 53–64.
- Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, 48(3), 261-297.
- Morresi, O., & Naccarato, A. (2016). Are family firms different in choosing and adjusting their capital structure? An empirical analysis through the lens of agency theory. *International Journal of Economics and Finance*, 8(7), 216–233.
- Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, 39(3), 574-592
- NACE Rev. 2 - Statistical classification of economic activities. (n.d.). Eurostat.
- Pérez-González, F. (2006). Inherited control and firm performance. *American Economic Review*, 96(5), 1559–1588.
- Poletti-Hughes, J., & Garcia, B. M. (2020). Leverage in family firms: The moderating role of female directors and board quality. *International Journal Of Finance & Economics*, 27(1), 207–223.
- Tsoutsoura, M. (2021). Family firms and management practices. *Oxford Review of Economic Policy*, 37(2), 323–334.
- Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, 80(2), 385–417.
- Villalonga, B., Amit, R., Trujillo, M., & Guzmán, A. (2015). Governance of family firms. *Annual Review of Financial Economics*, 7(1), 635–654.
- Volpin, P. (2002). Governance with poor investor protection: Evidence from top executive turnover in Italy. *Journal of Financial Economics*, 64(1), 61–90.
- 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.

Appendix

Appendix A: Classification of all Family Firms

1. Stellantis N.V.

Stellantis did not yet exist as a corporate entity as it was formed in 2021 through a merger between Fiat Chrysler Automobiles N.V. (FCA) and Peugeot S.A. (Groupe PSA). Exor N.V., the holding company of the Agnelli family was the largest single shareholder of FCA with 28.98% of the voting rights. EPF/FFP Group, the Peugeot family, had 12.23% of the voting rights of Groupe PSA. In 2019, John Elkann, the great-great-grandson of Giovanni Agnelli, the founder of Fiat was the chairman of the Board of Directors of FCA and the CEO of Exor N.V. So, Stellantis N.V. can be classified as a family firm.

2. LyondellBasell Industries N.V.

In 2019, the private holding controlled by Len Blavatnik, Access Industries, was the main shareholder of LyondellBasell Industries N.V. with 20,1% of the voting rights. Because Len Blavatnik, the CEO of Access Industries, was a non-executive director at LyondellBasell, LyondellBasell Industries N.V. can be classified as a family firm.

3. Heineken Holding N.V.

In 2019, L'Arche Green N.V. held 51.7% of the voting rights of Heineken Holding N.V. The Heineken family had a controlling stake of 88.7% in L'Arche Green N.V. resulting in an indirect control of 45.9% of Heineken Holding N.V. by the family. Because Charlene de Carvalho-Heineken was a member of the Board of Directors of Heineken Holding N.V., the company can be classified as a family firm.

4. Heineken N.V.

Heineken Holding N.V. owned 50.005% of the voting rights of Heineken N.V. in 2019. Therefore, the Heineken family had an indirect ownership of 22.9% of the voting shares of Heineken N.V. Because Charlene de Carvalho-Heineken was a member of the Supervisory Board, the company can be classified as a family firm.

Figure 2.

Indirect Control Chain of Heineken(2019)

1. Heineken family

↓ (88.7%)

2. L'Arche Green N.V.

↓ (51.7%)

3. Heineken Holding N.V.

↓ (50.005%)

4. Heineken N.V.

5. CNH Industrial N.V.

Exor N.V., controlled completely by members of the Agnelli family, held 42.5% of the voting rights of CNH Industrial N.V. In 2019, John Elkann, great-great-grandson of Giovanni Agnelli, was the Chairman of the board of directors of CNH Industrial N.V. resulting in a classification as a family firm for the company.

6. IVECO Group N.V.

IVECO Group N.V. was a business unit of the CNH Industrial N.V. group in 2019. Therefore, IVECO's ownership and control were embedded within CNH Industrial's shareholder structure. This results in an indirect ownership by the Agnelli family through Exor N.V., so, IVECO Group N.V. is classified as a family firm.

7. Universal Music Group N.V.

In 2019, Universal Music Group (UMG) was not yet a publicly listed company. French media conglomerate Vivendi S.A. held 100% of the voting rights of UMG. Vivendi S.A. was for 25% owned by Bolloré Group which was completely owned by Vincent Bolloré and other family members. Yannick Bolloré was the chairman of Vivendi's Supervisory Board, resulting in a classification as a family firm for UMG.

8. Ferrovial S.E.

The del Pino family were the founders and long-term controlling shareholders of Ferrovial S.E. with a total amount of voting right of 40.1% through multiple holding entities owned by family members. The main controlling holding entities consisted of: Casa Grande de Cartagena S.L., controlled primarily by María del Pino y Calvo-Sotelo, which held 20.2% of the voting rights of Ferrovial S.E. in 2019; Rijn Capital B.V., controlled by Rafael del Pino y Calvo-Sotelo, which held 9% of the voting rights of Ferrovial S.E. and Socefi S.L., owned by Leopoldo del Pino y Calvo-Sotelo, which held a 6% stake of the voting rights of Ferrovial S.E. Rafael del Pino y Calvo-Sotelo was the chairman of the Board of Directors and María del Pino y Calvo-Sotelo was a board member in 2019. Therefore, Ferrovial S.E. is a family firm.

9. Ferrari N.V.

The Agnelli family, through Exor N.V., owned 35.4% of the voting rights of Ferrari N.V. and John Elkann was the chairman of Ferrari in 2019, directly representing the Agnelli family's interests. So, Ferrari N.V. is classified as a family firm.

10. OCI N.V.

In 2019, the Sawiris family held 50% of the voting right of OCI N.V. through various holding entities NNS Holding Limited and NNS Luxembourg S.a r.l. Because Nassef Sawiris was the CEO and executive director of OCI N.V. in 2019, OCI N.V. can be classified as a family firm.

11. Ariston Holding N.V.

In 2019, Ariston Holding N.V. operated as Ariston Thermo Holding S.p.A. and was a privately held company under the control of the Merloni family. Merloni Holding S.p.A. was the primary holding company through which the Merloni family-controlled Ariston and Amaranta S.r.l., another investment vehicle associated with the Merloni family. Together, these entities held 100% of Ariston Holding N.V.'s voting shares. Moreover, Paolo Merloni was the executive chairman, and Francesco Merloni held the position of Honorary Chairman resulting in a classification as a family firm for the company.

12. Aalberts N.V.

In 2019, Aalberts Beheer B.V., Jan Aalberts and J.A.M. Aalberts-Veen held 20.5% of the voting shares. With Jan Aalberts being a member of the board of directors, Aalberts N.V. is classified as a family firm.

13. Davide Campari-Milano N.V.

Lagfin S.C.A. had 51% of the voting shares of Davide Campari-Milano N.V. in 2019. Lagfin S.C.A. is a holding company of the Garavoglia family. With Luca Garavoglia as the chairman of the board and Alessandra Garavoglia as a non-executive director, Davide Campari-Milano N.V. classifies as a family firm.

14. Sligro Food Group N.V.

In 2019, the holding company of the founding family of Sligro Food Group N.V., Slippens, had 34% of the voting rights of the company. With Koen M. Slippens serving as the CEO, Sligro Food Group N.V. can be classified as a family firm.

15. MFE-MediaForEurope N.V.

In 2019, Fininvest S.p.A. had 44.2% of the voting rights of MFE. Fininvest S.p.A. is the holding company of the Berlusconi family. Pier Silvio Berlusconi was the CEO in 2019 and Marina Berlusconi, Pier's sister, was a board member. Therefore, MFE N.V. is a family firm.

16. Redcare Pharmacy N.V.

Michael Köhler (founder) and his brother Frank Köhler (member of the supervisory board) had 26.4% of the voting rights in 2019, making the company a family firm.

17. Digi Communications N.V.

RCS Management S.A. held 89.6% of the voting shares of DIGI Communications N.V. in 2019. 59.2% of the voting shares of RCS Management S.A. were held by Zoltán Teszári, who founded Digi's predecessor entities in 1990s. This results in a total ownership stake of 53%. With Zoltán Teszári being the president and non-executive director of Digi Communications N.V., it is a family firm.

18. Cementir Holding N.V.

Caltagirone S.p.A., the holding company of the Caltagirone family, held 65.9% of the voting rights of Cementir Holding N.V. in 2019. Fransesco Gaetano Caltagirone served as the Chairman of the Board of Directors and his son, Fransesco Caltagirone Jr. held the position of CEO, making Cementir Holding N.V. a family firm.

19. Brunel International N.V.

Jan Brand, the founder, held 60.1% of the voting rights in 2019. He served as the chairman of the supervisory board, making Brunel International N.V. a family firm.

20. Koninklijke Vopak N.V.

Figure 3.

Indirect Control Chain of Koninklijke Vopak N.V.(2019)

1. **Van der Vorm family**
↓ (100%)
2. **FortyTwo B.V.**
↓ (100%)
3. **HAL Holding N.V.**
↓ (100%)
4. **HAL Investments B.V.**
↓ (51%)
5. **Koninklijke Vopak N.V.**

21. Basic-Fit N.V.

Founder and CEO René Moos held 20.3% of the voting rights through AM Holding B.V. Resulting in Basic-Fit N.V. being a family firm.

22. CTP N.V.

In 2019, founder and CEO Remon Vos held 100% of the voting rights making it a family firm.

23. Astarta Holding N.V.

With the Ivanchyk Family holding 38.4% of the voting rights in 2019 and Viktor Ivanchyk being the CEO of Asarta Holding N.V., it can be classified as a family firm.

24. TomTom N.V.

The co-founders Harold Goddijn and Corinne Vigreux both held 12.9% and 12.4% of the voting rights of TomTom N.V. Harold served as the CEO and Corinne held the position of CCO. Because they are married, TomTom N.V. can be classified as a family firm.

25. CM.COM N.V.

CM.COM was a privately held company in 2019 with its shares being divided between the CEO and COO of the company. Clubcompany1 B.V., the entity of Jeroen van Glabbeek (CEO), owned 50% of the voting rights of CM.COM and Clubcompany2 B.V., the entity of Gilbert Gooijers (COO), owned the other 50% of voting rights, making it a family firm.

26. Cosmo Pharmaceuticals N.V.

Founder and chairman Maura S. Ajani held 35% of the voting rights in 2019 through his personal holding Cosmo Holding S.a r.l. making it a family firm.

27. Hydratec Industries N.V.

Ten Cate Investeringsmaatschappij B.V., the investment company of Ten Cate family, held 69.9% of the voting rights of Hydratec Industries N.V. With Egbert ten Cate as the Chairman of the supervisory board and Judith ten Cate as a member of the Supervisory board, it can be classified as a family firm.

28. Ebusco Holding N.V.

Peter Bijvelds, the founder and CEO of Ebusco Holding N.V. held 35.4% of the voting rights. Therefore, Ebusco Holding N.V. is a family firm.

29. Fastned B.V.

All shares of Fastned were held by the Fastned Administratie Stichting (FAST), a foundation established to ensure the company's mission-driven approach. FAST issued Depositary Receipts (DRs) to investors, which conferred economic rights but not voting rights. However, Wilhelmina-Dok B.V. held approximately 50.73% of DRs and is controlled by co-founder Bart Lubbers, making Fastned B.V. a family firm.

30. AD Pepper Media International N.V.

Michael Oschmann held 50.5% of the voting rights of AD Pepper Media International N.V. in 2019. Oschmann also served as the chairman of the supervisory board making it a family firm.

31. NX Filtration N.V.

The main shareholders of NX Filtration N.V. are Infestos Holding E B.V. (50.7% and Stichting Administratiekantoor NX Filtration Holding (STAK)(12.6%). Both entities are controlled by B.H.F. ten Doeschot, which is also a board member of NX Filtration N.V., making it a family firm.

32. Ease2pay N.V.

The Internet of Cars v.o.f. (TIOC) held 48% of voting rights and was a partnership between Morgen Beheer B.V. (controlled by Jan H.L. Borghuis) and Loca Holding B.V. (controlled by Gijs J. van Lookeren Campagne). Both Borghuis (CEO) and van Lookeren Campagne (COO) hold 24% of the voting rights and an executive position in the firm, making it a family firm.

33. Envipco Holding N.V.

Alexandre Bouri, the founder and executive chairman of the board of directors of Envipco Holding N.V. held 52.9% of the voting rights through Megatrade International SA.

34. Parx Materials N.V.

In 2019, the founders of Parx Materials Michaël van der Jagt and Michele Fiori collectively held 79.2% of the voting rights in Parx Materials N.V. Representing 39.6% each. Michaël served as the chairman of the management board and Michele was a member of the management board, making it a family firm.

35. DGB Group N.V.

Selwyn A. M. Duijvestijn, founder and CEO of DGB Group N.V. held 25.8% of the voting rights in 2019, making it a family firm.

36. Value8 N.V.

Peter-Paul Ferdinand de Vries, the founder and CEO of Value8 N.V. held 43.7% of the voting shares in 2019. Therefore, Value8 is considered a family firm.

37. Exor N.V.

Giovanni Agnelli B.V. held 52% of the voting rights of Exor N.V. in 2019, the other 48% was divided between other Agnelli family members. John Elkann, the great-great-grandson of Giovanni Agnelli was the CEO of Exor N.V. Therefore, Exor N.V. can be classified as a family firm.

Appendix B: Descriptive statistics

Table B1

Summary Statistics of All Variables by Firm Type (Family vs. Non-family firms)

Descriptive statistics are presented without winsorization at the 1st and 99th percentiles. First, the full sample descriptives are displayed, second, the family firms descriptives and finally, the non-family firm descriptives are shown.

Full Sample (770 obs.)					
Variables	Mean	SD	Median	Minimum	Max
ROE (%)	-4.35	68.42	6.32	-554.75	860.28
ROA (%)	-3.55	21.61	2.33	-216.69	48.34
Log(<i>Employees</i>)	7.29	2.97	7.77	0.00	12.47
Log(<i>Wage</i>)	1.81	0.50	1.85	-1.26	3.79
Log(<i>TotalAssets</i>)	13.80	2.78	14.20	0.00	19.22
Leverage	0.57	0.33	0.57	0.00	5.22
Tobin's Q	3.34	43.41	0.95	0.00	1202.18
Family firms (259 obs.)					
ROE (%)	-2.87	46.00	6.15	-325.84	95.04
ROA (%)	-4.44	22.00	2.38	-141.00	48.43
Log(<i>Employees</i>)	7.22	2.83	7.43	0.00	12.47
Log(<i>Wage</i>)	1.72	0.62	1.80	-1.26	3.79
Log(<i>TotalAssets</i>)	13.96	3.22	14.23	0.00	19.22
Leverage	0.56	0.24	0.59	0.00	1.23
Tobin's Q	6.29	73.78	0.91	0.00	1202.18
Non-family firms (511 obs.)					
ROE (%)	-5.14	77.72	6.15	-554.75	860.28
ROA (%)	-1.87	20.71	2.28	-216.69	48.3
Log(<i>Employees</i>)	7.41	3.22	8.32	0.00	12.59
Log(<i>Wage</i>)	1.86	0.42	1.89	-0.36	2.93
Log(<i>TotalAssets</i>)	13.72	2.52	14.00	0.00	19.16
Leverage	0.58	0.37	0.56	0.00	5.22
Tobin's Q	1.79	2.50	1.01	0.35	27.77

Table B2*Descriptive Statistics by Year and Firm Type for the Dependent Variables*

Means with standard deviations in parentheses.

Year Firm Type	ROE (%)	ROA (%)	Log(<i>Employees</i>)	Log(<i>Wage</i>)
2017 Non-Family (0)	-8.22 (54.94)	-5.33 (22.98)	7.09 (2.80)	1.80 (0.43)
2017 Family (1)	-0.92 (41.11)	-1.76 (18.30)	7.28 (3.30)	1.65 (0.65)
2018 Non-Family (0)	-5.99 (51.31)	-4.49 (23.64)	7.15 (2.80)	1.82 (0.44)
2018 Family (1)	-4.06 (49.32)	0.18 (14.37)	7.31 (3.32)	1.69 (0.64)
2019 Non-Family (0)	-5.48 (36.72)	-4.51 (19.56)	7.22 (2.77)	1.84 (0.41)
2019 Family (1)	-3.42 (43.39)	-2.26 (18.17)	7.39 (3.28)	1.70 (0.61)
2020 Non-Family (0)	-9.80 (42.67)	-5.86 (20.70)	7.24 (2.82)	1.86 (0.39)
2020 Family (1)	-9.88 (54.48)	-3.26 (17.42)	7.44 (3.21)	1.68 (0.59)
2021 Non-Family (0)	-1.55 (44.98)	-1.01 (17.92)	7.24 (2.93)	1.89 (0.38)
2021 Family (1)	3.81 (27.45)	-0.13 (14.66)	7.39 (3.29)	1.76 (0.63)
2022 Non-Family (0)	-8.76 (54.13)	-4.31 (19.94)	7.32 (2.89)	1.89 (0.47)
2022 Family (1)	-2.54 (47.91)	-0.70 (16.38)	7.49 (3.19)	1.77 (0.61)
2023 Non-Family (0)	-6.42 (49.36)	-5.06 (21.64)	7.30 (2.94)	1.90 (0.45)
2023 Family (1)	-0.37 (28.28)	-1.56 (16.47)	7.58 (3.14)	1.78 (0.64)

Appendix C: Additional Results

Table C1

Parallel Trends Test with Dependent Variables

This table presents the results of a DiD model to test the parallel trends assumption with *ROE* being the dependent variable. The “Coefficient” column shows the coefficients for the interaction term per year. The post-treatment years are excluded (2020-2023). The coefficients of the interaction term for the pre-treatment years (2017 and 2018) are small in magnitude and statistically insignificant for all dependent variables. This suggests that family and non-family firms followed similar trends in the period before COVID-19. This supports the validity of the parallel trends assumption.

Variable	Year	Coefficient	SE	t-Statistic	p-Value
ROE	2017	4.63	10.31	.45	.65
ROE	2018	1.81	6.54	.27	.78
ROA	2017	.44	3.21	.14	.89
ROA	2018	2.00	2.95	.68	.50
Log(<i>Employees</i>)	2017	.02	.08	.21	.83
Log(<i>Employees</i>)	2018	-.02	.06	-.25	.80
Log(<i>Wage</i>)	2017	-.01	.04	-.36	.72
Log(<i>Wage</i>)	2018	.01	.04	.18	.86
Leverage	2017	-.08	.06	-1.40	.16
Leverage	2018	-.04	.04	-1.04	.66

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$. The year 2019 is the reference year and is omitted from the model. Standard errors are clustered at the firm level.

Figure C1

Yearly Interaction Effects per Firm Type with Dependent Variable ROE

For illustrative purposes, a visualization of the interaction coefficients from the DiD with *ROE* as the dependent variable. Each point represents the estimated difference in *ROE* between family and non-family firms for a given year, relative to the reference year 2019. Error bars represent the 95% confidence intervals.

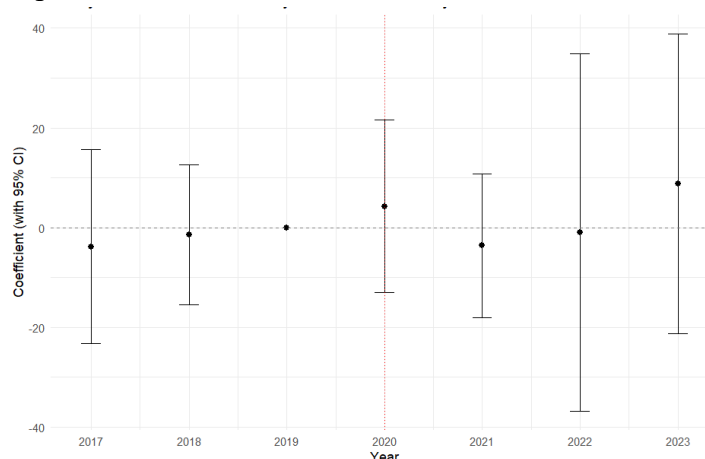


Table C2*Regression Results for ROE and ROA with Mediating Role of Log(Employees)*

This table shows the results of four OLS regressions examining the relationship between family ownership, the COVID-19 crisis, and firm financial performance (*ROE and ROA*), with a specific focus on the potential mediating role of employment retention. Models (1) and (3) serve as baseline specifications for *ROE* and *ROA*, respectively, while models (2) and (4) include *log(Employees)* to assess whether employment levels mediate the observed effects. All models include one-year lagged control variables (*Leverage*, *log(Total Assets)*, *Tobin's Q*), and standard errors are clustered at the firm level and shown in parentheses. Firm and year fixed effects are included but not reported.

Variables	ROE (1)	ROE (With Employees)(2)	ROA (3)	ROA (With Employees)(4)
Covid × Family	2.58 (6.56)	2.39 (6.57)	-0.75 (2.28)	-0.85 (2.27)
Log(<i>Employees</i>)	-	1.97 (1.66)	-	1.07 (0.77)
Leverage	9.06 (8.89)	5.33 (9.05)	3.27 (4.15)	2.89 (4.22)
Log(<i>Total Assets</i>)	-1.93 (3.99)	-3.02 (3.85)	1.18 (1.74)	0.58 (1.79)
Tobin's Q	-1.35 (2.94)	-1.40 (2.92)	-0.34 (0.49)	-0.37 (0.49)
Observations	660	660	660	660
R ²	0.58	0.58	0.78	0.78
Adjusted R ²	0.48	0.48	0.73	0.73

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

Appendix D: Robustness Analysis

Table D1

Pearson Correlation Matrix

The results indicate a strong positive correlation between *ROE* and *ROA* ($r = 0.75$), suggesting that firms with higher returns on assets tend to exhibit higher returns on equity as well. *ROE* and *ROA* are both moderately positively correlated with $\log(\text{Employees})$ and $\log(\text{TotalAssets})$. The variable $\log(\text{Total Assets})$ is highly correlated with $\log(\text{Employees})$ ($r = 0.87$), which is expected given the close relationship between firm size metrics. The interaction term *Covid x Family* is positively correlated with the *FamilyFirm* dummy ($r = 0.68$) and moderately correlated with the *Covid* dummy ($r = 0.43$). *Tobin's Q* shows modest negative correlations with *ROE*, *ROA*, $\log(\text{Employees})$, and $\log(\text{TotalAssets})$, most notably with *ROA* ($r = -0.31$). All reported correlations are below the commonly accepted threshold for multicollinearity ($r < 0.90$), suggesting no serious multicollinearity concerns for regression analysis.

Variables	1	2	3	4	5	6	7	8	9	10
1. ROE	1.00									
2. ROA	0.75	1.00								
3. $\log(\text{Employees})$	0.39	0.45	1.00							
4. $\log(\text{Wage})$	-0.06	-0.13	-0.31	1.00						
5. Leverage	-0.03	0.02	0.29	-0.14	1.00					
6. $\log(\text{Total Assets})$	0.43	0.48	0.87	-0.17	0.17	1.00				
7. Covid	0.00	0.01	0.02	0.06	-0.06	0.06	1.00			
8. FamilyFirm	0.04	0.07	0.03	-0.15	-0.01	0.04	0.00	1.00		
9. Covid x Family	0.03	0.05	0.03	-0.08	-0.01	0.05	0.43	0.68	1.00	
10. Tobin's Q	-0.25	-0.31	-0.25	0.13	-0.04	-0.31	-0.03	-0.06	-0.03	1.00

Table D2*Variance Inflation Factors (VIF) for the Independent Variables*

Values above 5 may indicate moderate multicollinearity; values above 10 indicate severe multicollinearity. The VIF value of $\log(\text{Employees})$ (5.16) and $\log(\text{TotalAssets})$ (4.77) are above the threshold of 5, indicating moderate to high multicollinearity. The other VIF values remain below the critical threshold of 5, indicating that multicollinearity is not a substantial issue in the analyses. Notably, the variables $\log(\text{Employees})$ and $\log(\text{TotalAssets})$ exhibit the highest VIF values, which is expected due to their strong correlation as proxies for firm size. However, none exceed the common cut-off values, supporting the robustness of the regression estimates.

Variables	VIF
Family Firm	1.03
Covid	1.01
$\log(\text{Employees})$	5.16
$\log(\text{Wage})$	1.22
Leverage	1.12
$\log(\text{Total Assets})$	4.77
Tobin's Q	1.12

Figure D1*Scatterplot of $\log(\text{Employees})$ and $\log(\text{Total Assets})$*

Due to the high correlation ($r = 0.87$) between $\log(\text{Employees})$ and $\log(\text{TotalAssets})$, models including both may suffer from multicollinearity. To mitigate multicollinearity, only one variable is included at a time in the main regressions.

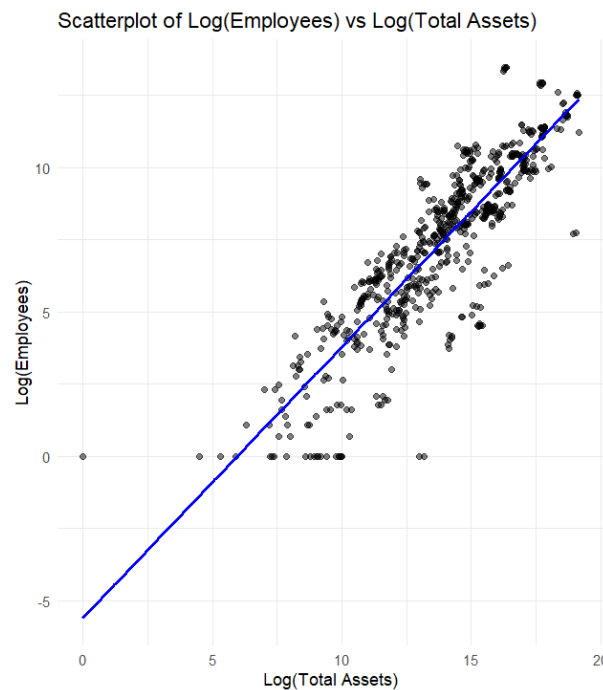


Table D3*Regression Results for ROE and ROA Using Alternative Family Firm Definition*

This table presents the results of robustness checks using alternative definitions of family firms to test the impact of the COVID-19 pandemic on financial performance. The interaction terms *Covid* $\times$ *Family30* and *Covid* $\times$ *Family10* represent the ownership thresholds of 30% and 10%, respectively. The dependent variables *ROE* and *ROA* are both winsorized at the 1st and 99th percentiles. The model includes one-year lagged control variables and firm and year fixed effects. 110 observations are dropped due to the lagged control variables. Standard errors are clustered at the firm level and shown in parentheses. Results show that while the coefficients of interest vary slightly across definitions, they remain statistically insignificant, suggesting robustness of the main findings.

Variables	ROE (30%)	ROE (10%)	ROA (30%)	ROA(10%)
Covid $\times$ Family30	6.43 (6.87)	-	2.33 (2.13)	-
Covid $\times$ Family10	-	7.65 (6.60)	-	1.96 (2.33)
Leverage	5.93 (8.59)	5.17 (8.85)	3.31 (4.18)	3.14 (4.18)
log(<i>TotalAssets</i>)	-2.11 (3.77)	-1.83 (3.94)	1.20 (1.69)	1.28 (1.73)
Tobin's Q	-1.39 (2.93)	-1.38 (2.97)	-0.29 (0.47)	-0.28 (0.48)
Observations	660	660	660	660
R ²	0.58	0.58	0.78	0.78
Adjusted R ²	0.49	0.49	0.73	0.73

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

Table D4*Regression Results for Log(Employees) and Log(Wage) Using Alternative Family Firm Definitions*

This table presents the results of robustness checks using alternative definitions of family firms to test the impact of the COVID-19 pandemic on financial performance. The interaction terms *Covid* $\times$ *Family30* and *Covid* $\times$ *Family10* represent the ownership thresholds of 30% and 10%, respectively. The dependent variables are *log(Employees)* and *log(Wage)*. The model includes one-year lagged control variables and firm and year fixed effects. 110 observations are dropped due to the lagged control variables. Standard errors are clustered at the firm level and shown in parentheses. Results show that while the coefficients of interest vary slightly across definitions, they remain statistically insignificant, suggesting robustness of the main findings.

Variables	Log(Employees) (30%)	Log(Employees) (10%)	Log(Wage) (30%)	Log(Wage) (10%)
Covid $\times$ Family30	.18 (.12)	-	-.05 (.05)	-
Covid $\times$ Family10	-	.03 (.15)	-	.004 (.05)
Leverage	.35 (.25)	.36 (.25)	-.09 (.10)	-.09 (.11)
log(<i>TotalAssets</i>)	.55*** (.15)	.55*** (.15)	.03 (.04)	.03 (.04)
Tobin's Q	.02 (.03)	.03 (.03)	-.01 (.01)	-.01 (.01)
Observations	660	660	660	660
R ²	.97	.97	.89	.89
Adjusted R ²	.96	.96	.87	.87

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

Table D5*Regression Results for Leverage Using Alternative Family Firm Definitions*

This table shows the regression results for *Leverage* using alternative definitions for family firms in column 1 (10%) and column 2 (30%). *FamilyFirm10* is a dummy which equals 1 for firms classified as family firms using an ownership threshold of 10% of the voting rights and 0 otherwise, *FamilyFirm30* is a dummy which equals 1 for firms classified as family firms using an ownership threshold of 30%. *Log(TotalAssets)* is the natural logarithm of total assets, a one-year lagged control variable for firm size, *ROA* and *Tobin's Q* are included as one-year lagged control variables for profitability and growth, respectively. 110 observations are dropped due to the lagged control variables. Industry and year fixed effects included. Standard errors are clustered at the firm level and shown in parentheses. *Covid* is omitted from the model because of perfect multicollinearity with the year fixed effects.

Variables	Leverage (10%)	Leverage (30%)
FamilyFirm10	-.13*** (.03)	
FamilyFirm30		-.1* (.04)
Log(<i>TotalAssets</i>)	.03*** (.01)	.03*** (.01)
ROA	-.01*** (.001)	-.01*** (0.001)
Tobin's Q	-.01 (.01)	-0.01 (.01)
Observations	660	660
R ²	.48	.47
Adjusted R ²	.41	.40

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.

Table D6*Regression Results for Leverage Using Alternative Family Firm Definitions*

This table shows the regression results for *Leverage* using alternative definitions for family firms in column 1 (10%) and column 2 (30%). *Covid × FamilyFirm10* is a dummy for the interaction term, which equals 1 for firms classified as family firms using an ownership threshold of 10% of the voting rights, *Covid × FamilyFirm30* is a dummy for the interaction term which equals 1 for firms classified as family firms using an ownership threshold of 30%. *Log(TotalAssets)* is the natural logarithm of total assets, a one-year lagged control variable for firm size, *ROA* and *Tobin's Q* are included as one-year lagged control variables for profitability and growth, respectively. 110 observations are dropped due to the lagged control variables. Firm and year fixed effects included. Standard errors are clustered at the firm level and shown in parentheses. *Covid* and *FamilyFirm10/FamilyFirm30* are omitted from the model because of perfect multicollinearity with the year and firm fixed effects.

Variables	Leverage (10%)	Leverage (30%)
Covid × FamilyFirm10	-.1 (.04)	
Covid × FamilyFirm30		-.1 (.03)
Log(<i>TotalAssets</i>)	.01 (.03)	.01 (.03)
ROA	-.002* (.001)	-.01* (0.001)
Tobin's Q	-.01 (.01)	-0.01 (.01)
Observations	660	660
R ²	.70	.70
Adjusted R ²	.58	.58

Note. Significance levels are denoted by *** $p < 0.001$, ** $p < .01$, * $p < .05$.