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# Family Firm Performance During the Covid-19 Crisis: Evidence from the Baltic States

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## Abstract

This study analyzes the impact of Covid-19 on family firm performance in Latvia, Estonia, and Lithuania using data from the Baltic Family Firm Institute. While family firms demonstrate better overall performance in all three countries, this trend is not consistent across the Baltics during the crisis, with family firms performing better in Latvia and Lithuania, and worse in Estonia during 2020-2021. Moreover, the study also distinguishes between founder and non-founder firms and finds that founder firms performed better both before and during the crisis, but with no statistical significance. Notably, 82% of the largest 200 family firms in Latvia are still owned by their founders, indicating that generational ownership change has not yet occurred in the Baltics.

## 1. Introduction

Family firms are a significant contributor to the economy in most countries (Aminadov & Papaioannou, 2020). Recent data from the Baltic Family Firm Institute (BFFI) (2022) reveals that single-family-controlled firms account for one-third of the largest firms in the Baltic countries. Since family firms exhibit different characteristics compared to non-family firms, understanding their performance relative to non-family firms is important (Anderson & Reeb, 2003).

While many studies have explored the differences in firm performance between family and non-family firms, the results and conclusions are varied. For instance, a meta-study conducted by Wagner, Block, Miller, and Schwens (2015) that analyzed 380 studies on family firm performance found a positive association between performance and family status when analyzing ROA (and ROE to a lesser extent). Given the many factors that differentiate family firms, it is essential to clearly define what constitutes a family firm and consider other factors that could influence performance, such as region, economic cycle period, country economy's background, and size of firms. Furthermore, it is important to select the most appropriate performance metrics that are less likely to be influenced by other factors. We choose to focus on return on assets as the main performance measure as it was the most used in previous literature, but, unlike studies based on the US public companies, we do not analyze Tobin's Q as we look at private companies. In this study, we aim to provide theoretical and practical conclusions regarding Baltic family firms by focusing on a specific region, time frame, and performance metrics. Through analyzing the data, we identify differences, possible reasons for them, and implications.

The Covid-19 pandemic had an immense impact on the global economy, and we set out to investigate how family and non-family firms responded to the crisis. Studying the crisis period allows us to examine the effect of corporate governance (as family versus non-family ownership is one of corporate governance factors) on firm value with less ambiguity. We chose to focus on the Baltic because research on this region is scarce, and the three Baltic countries are interesting in the context of transition economies, given their slightly different economic background from Western and Northern European countries. The family firm environment in the Baltics is unique, considering that these countries only regained their independence three decades ago and

transitioned from centrally planned to market economies, with family and non-family firms increasing in number during this time. The firms in the Baltics are, therefore, relatively young companies.

The Baltic countries were among the worst affected by the global financial crisis, particularly Latvia and Lithuania, where housing bubbles led to many people losing money and jobs during the 2007-2009 period. However, their recovery was swift due to demographic changes, as explained by Michon (2019), leading to what is also called "the Baltic Miracle". Even though the Covid-19 crisis was not a usual financial crisis, that does not reduce its important effects on the economy. "In contrast to the GFC, the Covid-19 crisis of 2020 is a very different shock in terms of its origin, transmission channels and impact," explains Verick, Schmidt-Klau and Lee (2021) as this crisis was highly dependent on the virus expansion and the lockdowns that implied traveling and trade restrictions. To understand how different firm performance changed, we analyzed family and non-family firm performance differences before and during the Covid-19 crisis.

Another important aspect to consider when analyzing family firms is the effect of the founder involvement in the firm's performance. This is particularly relevant in transition economies like the Baltics, where firms are relatively young, and there is a higher likelihood of the founder still owning or being involved in the business compared to Western or Northern countries. Miller, Breton-Miller, Lester, and Cannella (2007) distinguish between family firms and founder firms, where one of the founders remains a shareholder or chairman of the board. They, along with Zhou, He, and Wang (2017) and Villalonga and Amit (2006), found that only founder family firms outperform non-family firms. Therefore, we aim to investigate not only whether family firms perform better but also whether the founder involvement in the company affects family firm performance. This is particularly applicable in the Baltic countries as the founders, who are part of the first generation, are retiring, and the effects of their presence or absence are becoming more relevant.

To investigate the impact of the Covid-19 crisis on the performance of family and non-family firms in the Baltic region, our research question is the following:

**How did performance differ between family firms and non-family firms during the Covid-19 crisis in the Baltics?**

## 2. Literature review

In literature review, at first we summarize previous research done on family firm versus non-family firm performance in general, then focus on the crisis period. As the two main theories that researchers use to explain said differences, we find agency theory and socioemotional wealth (SEW); therefore, in the following subsections these aspects are explored. Then, we briefly introduce how the Baltic region differs from previous research regions – the US, Western and Northern Europe. Lastly, we explain the relevance of Covid-19 crisis regarding family firm performance and establish hypotheses to guide our research.

### 2.1. Family firm vs. non-family firm performance

Most of the previous research done to compare family and non-family firm performance used ROA as an accounting measure and Tobin's Q as a market measure to compare the performance of the two types of companies. A meta study by Wagner et al. (2015) that out of 380 studies, 137 use ROA as the performance indicator. Therefore, the results described below are taken from studies that use mainly ROA and Tobin's Q as performance measures. The studies that look at different performance measures are: Anderson, Mansi and Reeb (2003) - debt financing/cost of debt, Dyer (2006) - categories scores (KD), Bloom and Van Reenen (2007) - CSR, and Baek, Kang and Suh Park (2004) - holding period return (HPR). We looked also at other measures to gain a better understanding of possible reasons behind the differences in ROA performance of family and non-family firms.

Studies show that family firms contribute a large part to the country's economy not only in terms of GDP but also by providing jobs and working on innovation (Astrachan & Shanker, 2003). Since family firms possess different characteristics compared to non-family firms, the topic of family firm versus non-family firm performance has been researched all throughout the world, focusing both on individual countries, such as the US (Anderson & Reeb, 2003; Miller et

al., 2007), Japan (Allouche, Amann, Jaussaud, & Kurashina, 2008), Switzerland (Eugster & Isakov, 2019), and also covering more than one country as the sample (Faccio & Lang, 2002).

As for the US, there are many studies conducted on the topic. By looking at S&P 500 firms, Anderson and Reeb (2003) find that family firms outperform non-family firms. What is more, Anderson et al. (2003) show that due to fewer agency conflicts because of different incentive structures, family firms are also associated with lower cost of debt financing. A study based on Swiss listed firms done by Eugster and Isakov (2019) indicates a significant advantage in terms of stock returns for family firms. Asian countries also have been researched, and mostly reveal family firms as better performing than non-family firms. Allouche et. Al. (2008), who look at listed Japanese firms, show that family firms perform better than non-family firms in regards to financial performance, and the profitability of the company is dependent on the extent of family control - strongly controlled family firms show better performance than weakly controlled firms. More recent study of Japanese listed firms in the manufacturing industry shows the same result of family firms outperforming non-family firms (Koji, Adhikary, & Tram, 2020). Meta studies done about the topic (Hansen, Block, & Neuenkirch, 2020; Wagner et al., 2015), too, reveal a slight outperformance of family firms. By looking at 155 primary studies covering 35 countries, Hansen et al. (2020) conclude very slight family firm superiority in developed markets. Wagner et al. (2015) with a more than twice as large sample of 380 firms conclude the same:– a significant but very small outperformance of family firms. Overall, all these studies show at least a slight family firm advantage compared to non-family firms in terms of performance.

However, the family firm performance superiority is not always observed, and some studies show either no difference or inferior performance. Miller et. Al. (2007), who examine 2 different samples: Fortune 1000 firms and a random sample of 100 small public companies, find that there is no superior performance of family firms. Geudes et al. (2022) found that family firms perform worse by examining Portugal in service-centric business.

When looking deeper into the specifics of family firms, Anderson and Reeb (2003) find that when the CEO is a family member, the difference in performance is more prevalent on the positive side. Similarly, Villalonga and Amit (2006) and Miller et. Al. (2007) concluded that family firms obtain value only when the founder is a CEO. However, descendant CEOs reduce

firm value (Villalonga & Amit, 2006; Bloom & Van Reenen, 2007). Additionally, Bloom and Van Reenen (2007), by examining differences in management practices, find that family firms with a family CEO show worse managerial performance compared to a family firm with a non-family CEO. After analyzing these inconsistent outcomes, it appears that there is no definite conclusion on how the appointment of a family member as the CEO affects the overall performance of the family firms.

Overall, results of family firm performance studies contradict each other and conclusions are not generalizable. Possible reasons for ambiguity through academia regarding family versus non-family firm performance is that different studies have different samples (in terms of countries, years, publicly listed versus private firms, size of firms), different economic cycle period, different performance metrics and different family firm definition. Dyer (2006) in his paper develops a theoretical framework to understand why the studies yield different results and concludes that the performance differences are dependent on 2 factors – agency costs and family liabilities. The term family liabilities mean poor human, social, and financial capital, lack of trust, no networks, etc. (Dyer, 2006). A decade later, after research on the topic of family firms had been hugely increased, Dyer reviewed his own work and developed a new framework with 2 other factors: socioemotional wealth and firm financial performance (Dyer, 2018).

In academia it is explained that the main cause for differences in performance lies in agency costs and in the way how firms define success. Non-family firms largely define their success on financial performance while family firms have other factors that they care about, such as keeping close social ties and having higher emotional attachment. This concept is called socioemotional wealth, and recently researchers are looking at socioemotional wealth as the biggest difference distinguishing family firms and non-family firms.

## 2.2. Family firm vs. non-family firm performance during crisis

While most research is concentrated on family versus non-family performance in general, there are studies that examine the performance differences during periods of crisis. As Baek et al. (2004) outlined in their paper about the Korean financial crisis and family firms, focusing on the crisis period gives opportunity to examine the effects of corporate governance on firm value without facing ambiguity. We can find some links by examining a set of corporate governance

and related measures in time preceding the crisis and during the crisis to explain the changes in firm value and financial performance. In a way, the crisis acts as an external shock, which helps to isolate family firm reaction compared to other firms.

We mostly look at the global financial crisis and the Asian crisis to gain understanding of previous research, as Covid-19 pandemic is a recent event and not much research is done about family versus non-family performance during this crisis. Zhou et al. (2017), looking at the US, examined family firm performance during the great financial crisis in the S&P 500 and found that there is no statistically significant difference in performance between family and non-family firms during the financial crisis, while founder firms showed a better performance that could be due to the advantage of the founder presence. In other words, founders' attachment and higher willingness to sacrifice for long-term growth might lead to better performance among the biggest listed companies in the US. In the next two subsections we attempt to find reasons for the differences in performance between family and non-family firms in crisis.

### 2.2.1. Agency theory

Le Breton and Miller (2009) explores different ways of evaluating public family firm conduct: agency theory and stewardship theory in particular. Agency theory, the theory that addresses the relationship between a principal and an agent, corresponds not only to owner-manager relationship where company owner trusts the manager to make key decisions, but also to owner-owner relationship where minority shareholders rely on the majority shareholder (La Porta, Lopez-De-Silanes, & Shleifer, 1999). On the positive side, owner-manager conflict has a smaller impact in family firms than in non-family firms due to family members having voting power to protect against being exploited (Anderson & Reeb, 2003). On the negative side, agency theory highlights that family firm owners are more heavily tied to the company success, and may use voting power for personal or family control, as well as risk-aversion, which then leads to underinvestment. Based on owner-owner conflict in relation to family firms, agency theory predicts underinvestment, pyramidal ownership and management, and opposition to external shareholders, which leads to worse financial returns (Le Breton-Miller, & Miller, 2009). Lins, Volpin and Wagner (2013) find that agency costs provide an explanation for differences in performance during the crisis. However, as with all theories trying to explain a specific

phenomenon, agency theory too should be used in tandem with other theories, such as stewardship theory that relaxes the assumptions of rationality, self-interest and greed (Granovetter, 2005).

Stewardship theory encompasses a broader view of human behavior – particularly that people are driven by intrinsic motivation, and people are motivated by service to others, altruism and generosity rather than just self-interest (Davis, Schoorman, & Donaldson, 1997). From the view of stewardship theory, family firms should perform better than non-family firms, as they are driven by long-term thinking because of their attachment to the company emotionally and their wanting to preserve the company to the next generations. This leads them to generous investments with long-term thinking in mind (Le Breton-Miller and Miller, 2009). By advancing research and trying to put many different aspects of family firms together, the concept of SEW was developed.

### 2.2.2. SEW, lack of diversification and underinvestment

The main idea of SEW is that family firms differ from non-family firms with their goals and values, which are determined not only by financial aspects but even more so by emotional and social aspects (Berrone, Cruz, & Gomez-Meija, 2012). Berrone et al. (2012) distinguish specific dimensions of SEW model acronymed as FIBER, which stands for: "Family control and influence, Identification of family members with the firm, Binding social ties, Emotional attachment of family members, and Renewal of family bonds to the firm through dynastic succession." These are the aspects that influence family firm decisions and consequently, their financial performance, and many researchers explain family firm performance differences from non-family firms through SEW.

Minichilli, Brogi and Calabrò (2015) find that during the crisis, family firms outperform non-family firms. It might be explained by the SEW approach because family firms become risk-seeking during a crisis when ownership is at stake. Then, by looking at the differences between family firms with different ownership concentration, authors find that during a crisis, family firms with more diversified ownership perform better than family firms with undiversified or large family shareholders (Minichilli et al., 2015).

Arrondo-Garcia, Fernandez-Mendez and Menendez-Requejo (2016) also explore performance differences between family firms with different characteristics. By looking at differences in performance of firms with different generations in control, they explain it through the effect of SEW. According to principles of SEW, the first-generation in control is expected to be more concerned about preserving the firm for future generations and, therefore, in a situation of a crisis, makes decisions that might not be as good from the short-term profitability's perspective but preserves SEW. Since their research reveals that first-generation controlled firms perform worse than multi-generational firms during crises, it leads to thinking that firms with the founder being present in the firm underperform during a crisis. Additionally, Zhou et al. (2017) find that there is a difference in performance between family and non-family firms only when taking in consideration founder firms. Authors explain the similarity between non-founder family firms with non-family firms by the fact that family firms lose their characteristics by aging and generations changing (Zhou et al., 2017). However, Zhou et al. (2017) find that founder firms outperform non-family firms, which is in conflict with Arrondo-Garcia et al. (2016) who reveal that first-generation family firms underperform. Although more studies show that founder family firms underperform non-founder family firms during a crisis, there in not a clear conclusion on founder impact on the firm performance in family firms.

Zhou et al. (2017) looks at possible explanations of why there is a performance gap between family and non-family firms, and they conclude that it is because family firms overinvest less. As for underlying reasons for that, it might be impacted both by fear of control loss or long-term thinking. More investment would lead to more diversification, which in turn might result in control loss. Croci, Doukas and Gonenc (2011) show that owners become risk-averse when faced with the fear of control loss; however, Zhou et al. (2017) explain it by long-term thinking and being cautious. The studies explain family firm outperformance by long-term thinking and not wanting to make impulsive and not thought-through investments (value-destroying M&As and capital expenditure).

This finding that family firms are risk-averse in crisis situations because of long term thinking is in contradiction with Minichilli et al. (2015) reasoning that says otherwise that family firms become risk-seeking in financial distress. While there is no possibility to determine which

one is true and the allowance for risk might differ from company to company, the common denominator in terms of family versus non-family firms is shareholder diversification.

Same as Zhou et al. (2017), Amman and Jessaud (2012) find family firm outperformance and also explain it by long-term thinking. However, the way they express family firm long-term thinking is totally opposite to Zhou et al. (2017) because they show that family firms invest more, not less, during a crisis. By investing more, family firms are said to be thinking about the firm's future even in a situation of economic downturn. Lins et al. (2013) also explain the performance differences by underinvestment; however, they find family firm underperformance. By looking deeper into the reasons for underperformance, they find that only family firms with high expected agency costs underperform non-family firms. They explain it by under-diversified ownership structure which leads the owner trying to keep the control of the firm and it comes at an expense of other metrics, such as financial performance, and negatively impacts minority shareholders, the effect of which is explained by the agency theory.

Considering these different findings, a clear conclusion cannot be made neither of the family firms' superior or inferior performance compared to non-family firms, nor of the explanation of the true reasons that cause these differences, at least not worldwide. However, as a common aspect that impacts it can be said to be shareholder diversification and the level of investment during crisis time.

## 2.3. Baltic family firms

The most famous papers about family firms were done about the US, and also the most developed European countries. These countries have had strong economies for a long time, and have a good record of companies, not to mention that most researchers look at the stock market. Baltic countries: Estonia, Latvia, and Lithuania, are different from those because Baltic countries are advancing from emerging markets to developed economies after the transition from centrally-planned to market economies in the 1990s. Rapid privatization and joining the EU in 2004 allowed them to begin rapid economic development due to private ownership being a superior ownership structure over state ownership, and managers that are founders drive better performance in the transition countries (Iwasaki, Ma, & Mizobata, 2022). Firms managed by their founders are particularly relevant as the collapse happened a few decades ago, and the

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owners of family firms are most likely to be founders or at least first-generation descendants. Because these economies are so young, family firms played a crucial role in their development, and it is of major significance to understand whether or not their performance is sustained, and do they have better crisis aversion. It is also unclear whether or not Western European country research results about family firms can be easily applied to Eastern European countries.

## 2.4. Covid-19

If we look at crises and how they have affected the economy, the newest of them is the Covid-19 pandemic. In regards to family firms, there has been research already done on this topic for other regions and other performance metrics. Ding, Levine, Lin an Xie (2021), looking at stock prices, found that firms controlled by families (especially through direct holdings and with non-family managers) along with large corporations and governments were performing better during the pandemic by having smaller stock price declines. Similarly, Amore, Pelucco and Quarato (2022) who looked at Italian firms found that family firms outperform non-family firms both by stock market performance and operating profitability. They explain it by family firm tendency to manage the firm with long term success in mind; therefore, they are seen as to perform potentially better by other shareholders, which increases trust, and banking institutions, which ensures better debt prerequisites (Amore et al., 2022). On the negative side, however, they admit that family firms might as well be conducting strategies that are intended to allow them to keep the ownership at the expense of minority shareholders. The research finds that family firms perform even better if the ownership is spread between more family members and there are no large minority shareholders, which suggests that diversification again plays an important role (Amore et al., 2022).

Żukowska, Martyniuk and Zajkowski (2021) who examine Polish firms look at Covid-19 and its impact from a rather little researched perspective – survivability capital or family firm members' personal resource availability and their willingness to contribute their personal resources to the firm. They find that indeed, family firm members are willing to denote their personal resources in terms of money or unpaid labor to the firm in a crisis, such as Covid-19 pandemic. Another important factor that is highlighted during a crisis is risk, so Santos, V. Tavares, F. O. Tavares and Ratten (2021) look at how considerate are family firms of risk, and

find that they are putting more importance on different types of risks, which also leads to better financial performance.

All in all, by the little research done on family firm versus non-family firm performance during the Covid-19 crisis, it seems that family firms performed better, mainly because of their characteristics, such as long term thinking and the wanting to preserve the company value to the next generations, which is explained by the SEW approach. To see whether it was the same in Baltic countries, we will be exploring the performance differences between family firms versus non-family firms in Baltic countries during the Covid-19 crisis.

After examining the literature surrounding our research question, we came up with the following hypotheses.

1. *Family firms outperform non-family firms during the Covid-19 crisis in the Baltic countries*
2. *Founder family firms outperform non-founder family firms during the Covid-19 crisis in the Baltic countries*

Additional details and a summarizing table about previous research done about family versus non-family firm performance can be found in Appendix A. Existing literature on the topic was used as the basis for formulating our hypotheses.

## 3. Methodology

### 3.1. Data collection

The sample consists of 98148 firm-year observations, representing 16358 nonfinancial firms (excluding NACE 64 and 65 industries, that are banks and insurance companies) that have at least 2 million EUR annual revenue or at least 1 million EUR annual revenue and 2 million EUR total assets in 2020. Companies above these thresholds were chosen following the Baltic family firm institute's existing database – companies that are larger than Micro enterprises classified by the European Commission (European Commission, n.d.). We take observations from the 4-year period preceding Covid-19 (2016-2019) and 2 years of the actual crisis (2020-2021). Since we look at all non-financial firms above 2 million firms in the Baltics, we look at a

big part of the driving force of the countries' economies. We exclude firms that are not active at some point during the 6-year period.

The BFFI provided a database of family firms (https://bffi.global/). The database defines family firms if more than 50.01% of shares are held directly or indirectly by one individual or multiple individuals with the same last name and at least one family member has a board seat in 2020. Indirect ownership is not an issue as BFFI uses Bureau van Djik Orbis as the source, which accounts the "Global Ultimate Owner" of a company – the person who owns the company either directly or indirectly. For data collection purposes we used Bureau van Djik Orbis to supplement the existing data from BFFI for our analysis. Then we collected founder information about Latvian firms, as according to Zhou et al. (2017) it was the firms with founders still present that created the superior performance for the sample of family firms of S&P500 and the GFC. We hand-collected detailed founder information about the top 200 Latvian family firms by assets from our sample, excluding widely held corporations (Akciju Sabiedrība). We chose the largest firms by assets instead of revenue to have a sample that would be less dictated by the crisis since we took 2020 data for selection of the firms (because for 2021, there still were many missing and unreported values). As we were looking at 2020, the year when the Covid-19 crisis hit the world (and the Baltics) the hardest, revenue would not be a good measure since for many firms it decreased substantially. For data collection, we were using Lursoft. Lursoft is a Latvian public company database that works with the state to provide company information to the public. Since we had to do manual data collection that consisted of checking information about each firms' founders and their changes each year, the founder/non-founder firm sample is only 200 firms. Also, since the database of Lursoft has only Latvian firms, we narrowed the founder effect analysis from Baltic countries to Latvia. The company database was used, and the historical shareholder data about founders and their siblings and second-generation relatives was extracted using the access kindly provided by SSE Riga. We define founder firms as firms with one or more founders still present in the company either as a shareholder or as a board member.

Family firm definition varies from study to study but the 2 main characteristics of family firms are that founding family or its members are on the board and founding family or its members own a fraction of equity or shares (Anderson & Reeb, 2003). When talking about board members, we consider a firm to be a family firm if there is at least one family board member but

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regarding ownership, the fractions owned must be larger than 50% for privately held firms and at least 25% for public firms as it is in the sample provided by BFFI. **In this paper family firms are defined as companies that in 2020 had one or more family members (by surname) holding more than 50% of shares, and at least one family member was a member of the board.** Since we define firms as family firms depending on their situation in 2020, the variable is time-invariant, and we have 5198 family firms and 10772 non-family firms that have at least one observation of the performance measure totaling to 15970 firms that are analyzed.

### 3.2. Performance measure

Following Anderson and Reeb (2003), we use two measures of return on assets to measure performance, we use net income on book value of total assets (ROA), and EBIT scaled by book value of total assets - Operating returns on assets (OROA) that help to control for the differences in tax policies between countries and firm capital structure differences, used by Zhou et. al. (2017) and previously by Bennedsen, Nielsen, Perez-Gonzalez and Wolfenzon (2007) as a natural measure for firm performance. As opposed to return on equity (ROE) or return on capital employed (ROCE), OROA compares firm performance to total assets instead of a fraction of them.

### 3.3. Univariate difference in differences analysis

Before examining the family firm effect on the crisis, we examine how the descriptive values of performance measures change before and during the crisis for non-family firms and family firms following Zhou et al. (2017). This helps to visualize the overall differences in the light of the 2020-2021 crisis. Following Zhou et al. (2017), we examine how the performance measures have changed from before to during the crisis to analyze the overall differences.

### 3.4. Firm fixed effects regression

Following Zhoue et al. (2017), we use a firm fixed effects model with a dummy interaction to examine how family firm status impacts firm performance during the crisis (Equation 1). Fixed effects model is used to control for unobserved differences in companies that are fixed over time and changes over time that do not vary across companies, which allows to

look only at how changes in the explanatory variables influence performance instead of their differences that are constant.

$$(1)\ \text{Firm Performance}_{i,t} = \beta_0 + \beta_1 \text{Family}_i + \beta_2 \text{Family}_i * \text{Crisis}_t + \beta_3 \text{Control Variables}_{i,t-1} + \beta_4\text{-}\beta_{101}\text{NACE letter}_i + \varepsilon_{i,t}$$

- Firm Performance$_{i,t}$ = performance measures is defined as ROA(i,t), and OROA(i,t) (EBIT/total assets) of each company i at time t.
- Family$_i$ = binary variable, equals one if the firm is a family firm, zero otherwise.
- Crisis$_t$ = binary variable, equals one for years 2020, 2021, 0 otherwise.
- Family$_i$*Crisis$_t$ = interaction variable
- NACE letter$_i$ = field of economic industry that is a variable that acts as firm fixed effects
- $\varepsilon_{i,t}$ = error term
- Control Variables$_{i,t-1}$ = control variables which include natural logarithm of total assets, natural logarithm of age, and total debt divided by total assets for company i at time t. We incorporate control variables following Anderson and Reeb (2003), Villolanga and Amit (2006), and Miller et al. (2007). Due to our sample consisting of private firms we will only consider firm size, age, and leverage as control variables to account for the observed fixed effects.

We drop the Family dummy from the regression as family ownership is time-invariant in our sample and firm fixed effects already control for it. NACE letters are dropped as firm fixed effects control for them.

We then take on the more traditional approach previously used by Anderson and Reeb (2003) and examine performance differences between the two groups of firms each year individually and use pooled OLS with industry and year fixed effects as dummies (Equation 2). Additionally, we cluster standard errors on year and firm level, and include countries as dummies to account for unobserved country differences.

$$(2)\ \text{Firm Performance}_{i,t} = \beta_0 + \beta_1 \text{Family}_{it} + \beta_2 \text{Control Variables}_{i,t-1} + \beta_3\text{-}\beta_{102}\text{NACE letter}_i + \beta_{102}\text{-}\beta_{108}\text{Year}_t + \beta_{108}\text{-}\beta_{111}\text{Country}_i + \varepsilon_{i,t}$$

In the industry fixed effects

regression, we use the same explanatory variables as in the fixed effects with additions of country and year dummies, and subtraction of the interaction term as we analyze by each year individually. Year dummy is dropped when analyzing years individually.

- Firm Performance$_{i,t}$ = performance measures is defined as OROA(i,t) (EBIT/total assets) of each company i at time t.
- Family$_{it}$ = binary variable, equals one if the firm is a family firm, zero otherwise.
- Control Variables$_{i,t}$ = control variables which include natural logarithm of total assets, natural logarithm of age, and long-term debt divided by total assets for company i at time t.
- Year$_t$ = dummy variables, equals 1.0 for each of the 6 years in the sample.
- Country$_i$ = dummy variable, equals 1.0 for each country.

Lastly, we examine 200 largest Latvian family firms, divide them into founder firms and non-founder firms and examine their performance before and during the crisis. Due to a small sample size, we do not run regressions, instead we analyze the descriptive statistics of these companies' performance measures before and during the 2020-2021 crisis.

## 4. Results

### 4.1. Analysis of differences

From our sample of 15970 unique firms and 85184 firm-year observations that we divide in family and non-family firms we observe differences in variable means in the 2016-2021 period (Table I). All 3 Baltic countries taken together, we look at 10772 non-family firms, and 5198 family firms. Family firms compose 33% of the data set, 38% in Estonia, 37% in Latvia, and only 26% in Lithuania (Appendix B). If we plot operating return on assets - the main performance measure, we find that firm performance has grown until 2020, then it fell in 2021 for the average firm in the sample (Figure 1). Looking at the means plotted by years between countries (Figure 2), the countries have a similar range of operating return on assets, but different trajectories, consequently we analyze each country and the group in further sections.

**Figures 1. and 2.** Means of operating return on assets in percent across years in the whole sample with standard deviation displayed.
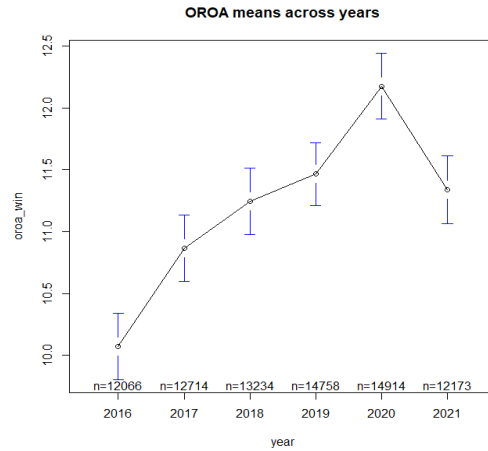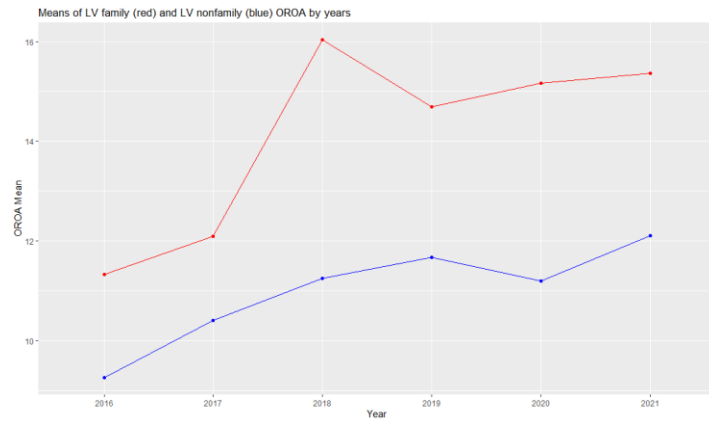
*Means of operating return on assets in percent across years in individual countries plotted by color, red represents Latvia, blue represents Lithuania, and green represents Estonia.*
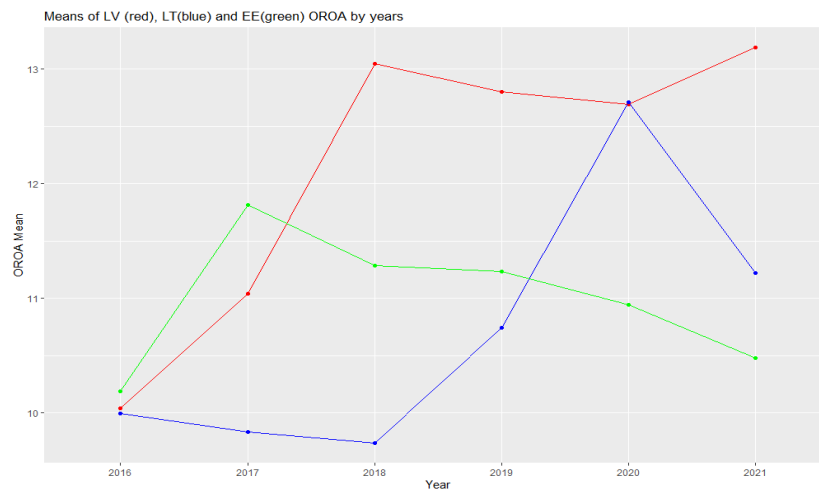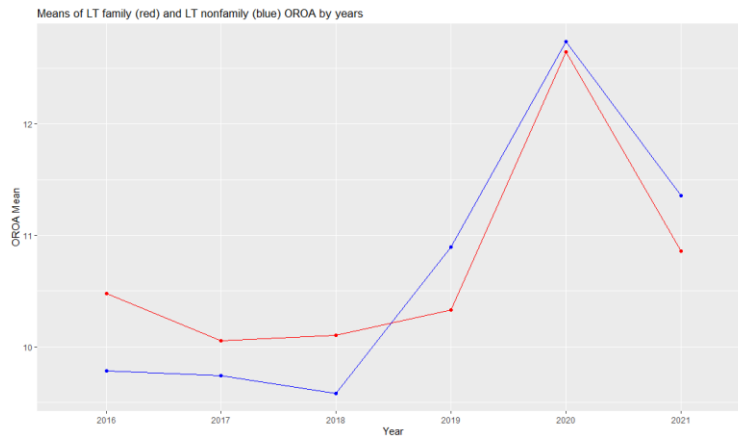


Examining the three Baltic states and their family and nonfamily company performance dynamics, we see that family firms consistently show higher operating return on assets figures than nonfamily firms in Latvia and Estonia. In Latvia there has been a higher performance by family firms which has stayed largely unchanged except for the spike in 2018. In Estonia, family firms performed better in all years, but in 2021 the difference dropped significantly. Also, the difference was smaller than in Latvia. In Lithuania, on the other hand, there does not seem to be a large difference between family and non-family firms in our sample.

**Figures 3., 4. and 5.** Means of operating return on assets in percent across years by individual country. Red line represents family firms in a country, blue line represents non-family firms in a country.
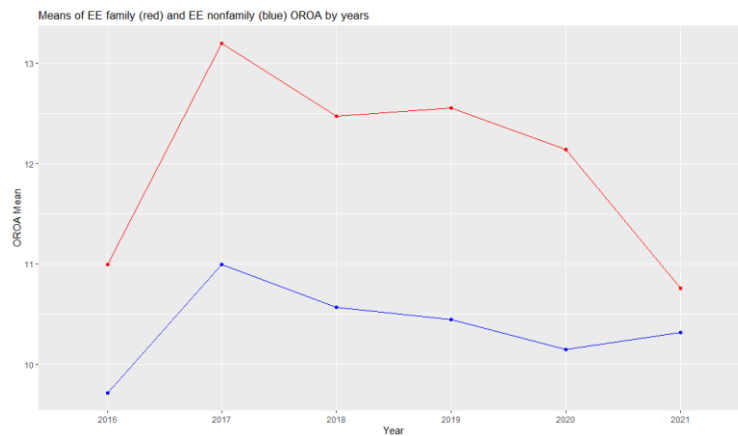
*Latvia*

Means of LV family (red) and LV nonfamily (blue) OROA by years

*Lithuania*

Means of LT family (red) and LT nonfamily (blue) OROA by years

*Estonia*

Means of EE family (red) and EE nonfamily (blue) OROA by years

Above we examined the performance measure mean dynamics in the 3 Baltic states, now we look at pre-crisis state in 2019 and put the observations into numbers and look into other variables (Table 1). Family firms show a higher return on assets on average.  In Latvia, family firms show 12.88% operating return on assets and 11.41% return on assets, while non-family

firms show 9.28% and 7.96%, respectively. Return on equity numbers display an even more unexpected frame with family firms outperforming non-family firms by 7.49 percentage points. Turning to Lithuania, family firms seem to perform better on average by about 0.5 p.p. in return on assets and 0.83 p.p. worse than nonfamily firms in return on equity - overall small differences which we already saw in the graphs above. Lastly, Estonian family firms are somewhere in the middle between Latvian and Lithuanian family firms: they show 1.8 p.p. higher OROA, 1.94 p.p. higher ROA, and 2.83 p.p. higher ROE than nonfamily firms. These numbers are not surprising after looking at plots (Figures 3, 4 & 5).

Of control variable means, non-family firms are larger in size on average, while debt divided by assets is only slightly lower. Firm age is also an interesting variable to examine because family firms are on average older in Lithuania, while they are younger in Estonia by the same value of 2 years. Notably, the mean of age is a small number of years, which is very characteristic of the Baltic states due to the countries gaining independence only in 1991. However, all countries have high maximums in age with the oldest firms being non-family firms with more than 120 years. In Estonia, also the maximum family firm age is as high as 78 years, while for Latvia and Lithuania it is only 32 years. It is possible that such a significant difference occurs because of better historical reporting. All mean differences were tested using one-sided t-tests and surpassed the 99% confidence level except for firm age in Latvia that is significant at the 10% level and return on assets and return on equity in Lithuania. Extended visualizations can be found in Appendix C.

**Table 1.** Descriptive statistics of main variables in 2019. Differences in means and their significance are derived using one-sided T-tests. Firm-year observations. Outliers larger than 99th percentile and smaller than 1st percentile were winsorized for all variables except for firm size and firm age. Table created by the authors.

| Latvia | All family firms (I) | | | | | | Nonfamily firms (II) | | | | | | Difference in Mean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | (I)-(II) | |
| Size | 8611 | 14.21 | 14.29 | 1.48 | 0.69 | 19 | 15029 | 15.06 | 14.975 | 1.56 | 3.30 | 22 | -0.85 | *** |
| Firm age | 9774 | 19 | 18.00 | 9 | 2 | 32 | 16830 | 19 | 18 | 9 | 2 | 123 | 0.2 | * |
| Debt-to-assets | 8587 | 19.24 | 11.2815 | 22.43 | 0.00 | 97 | 14915 | 60.19 | 6.511 | 32.27 | 1.04 | 157 | -40.95 | *** |
| Revenues | 8555 | 6183 | 3099 | 11931 | 75 | 147046 | 14911 | 11647 | 4037 | 23231 | 75 | 147046 | -5464 | *** |
| Net income | 8613 | 301 | 120.89 | 734 | -1750 | 9953 | 15022 | 570 | 158.04 | 1596 | -1750 | 9953 | -269.53 | *** |
| EBIT | 8606 | 332 | 141.27 | 759 | -1461 | 10168 | 15030 | 651 | 190.79 | 1675 | -1461 | 10168 | -318.13 | *** |
| OROA | 8600 | 12.88 | 9.086 | 18.59 | -46.81 | 76 | 15019 | 9.28 | 6.391 | 17.47 | -46.81 | 76 | 3.6 | *** |
| ROA | 8605 | 11.41 | 8.042 | 17.88 | -50.14 | 70 | 15011 | 7.96 | 5.5708 | 16.72 | -50.14 | 70 | 3.45 | *** |
| ROE | 8101 | 29.00 | 23.39 | 38.15 | -148.00 | 128 | 13970 | 21.51 | 16.41 | 39.09 | -148.00 | 128 | 7.49 | *** |

| Lithuania | All family firms (I) | | | | | | Nonfamily firms (II) | | | | | | Difference in Mean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | (I)-(II) | |
| Size | 9355 | 14.60 | 14.53 | 1.25 | 0.69 | 21 | 24620 | 15.01 | 14.879 | 1.47 | 3.14 | 22 | -0.41 | *** |
| Firm age | 10212 | 20 | 20.00 | 8 | 3 | 32 | 29640 | 18 | 18 | 8 | 2 | 86 | 1.75 | *** |
| Debt-to-assets | 2886 | 18.34 | 13.911 | 18.64 | 0.00 | 97 | 11294 | 12.71 | 2.99 | 18.32 | 0.00 | 97 | 5.63 | *** |
| Revenues | 9848 | 7809 | 3481 | 16440 | 75 | 147046 | 27285 | 10868 | 4000 | 21911 | 75 | 147046 | -3059.7 | *** |
| Net income | 9340 | 378 | 119.13 | 1097 | -1750 | 9953 | 24483 | 572 | 149.62 | 1536 | -1750 | 9953 | -193.51 | *** |
| EBIT | 9340 | 412 | 147.05 | 1073 | -1461 | 10168 | 24500 | 635 | 183.28 | 1573 | -1461 | 10168 | -222.44 | *** |
| OROA | 9340 | 10.53 | 7.716 | 13.57 | -46.81 | 76 | 24496 | 9.97 | 6.617 | 16.28 | -46.81 | 76 | 0.56 | *** |
| ROA | 9340 | 8.69 | 6.417 | 12.14 | -50.14 | 70 | 24479 | 8.27 | 5.593 | 15.02 | -50.14 | 70 | 0.42 | ** |
| ROE | 9189 | 19.19 | 14.4 | 29.33 | -148.00 | 128 | 23616 | 20.02 | 13.99 | 35.51 | -148.00 | 128 | -0.83 | ** |

| *Estonia* | All family firms (I) | | | | | | Nonfamily firms (II) | | | | | | Difference in Mean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | (I)-(II) | |
| *Size* | 10383 | 14.46 | 14.53 | 1.48 | 2.08 | 20 | 17416 | 15.14 | 15.034 | 1.57 | 3.22 | 23 | -0.68 | *** |
| *Firm age* | 11208 | 18 | 17.00 | 10 | 2 | 78 | 18258 | 20 | 19 | 13 | 2 | 121 | -2.09 | *** |
| *Debt-to-assets* | 9320 | 17.50 | 8.288 | 21.86 | 0.00 | 97 | 15977 | 20.12 | 8.672 | 25.03 | 0.00 | 97 | -2.62 | *** |
| *Revenues* | 10306 | 6233 | 2930 | 13688 | 75 | 147046 | 17291 | 11654 | 4179 | 22187 | 75 | 147046 | -5421.47 | *** |
| *Net income* | 10347 | 393 | 138.27 | 1070 | -1750 | 9953 | 17369 | 664 | 206.33 | 1642 | -1750 | 9953 | -271.03 | *** |
| *EBIT* | 10342 | 386 | 156.52 | 940 | -1461 | 10168 | 17389 | 724 | 237.01 | 1664 | -1461 | 10168 | -337.88 | *** |
| *OROA* | 10341 | 11.25 | 8.055 | 18.12 | -46.81 | 76 | 17388 | 9.45 | 7.075 | 16.38 | -46.81 | 76 | 1.80 | *** |
| *ROA* | 10346 | 10.28 | 7.412 | 17.79 | -50.14 | 70 | 17368 | 8.34 | 6.397 | 16.17 | -50.14 | 70 | 1.94 | *** |
| *ROE* | 9830 | 20.29 | 15.26 | 36.99 | -148.00 | 128 | 16706 | 17.46 | 13.6 | 37.20 | -148.00 | 128 | 2.83 | *** |

***, **, * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

When examining family and non-family firm split in Table 2, our analysis suggests that family firms are present in all industries classified by NACE2 codes where there are at least 150 firms from our sample. Family firms are the least represented in the utility, health and real estate sectors, which can be explained by the state involvement and expected larger shareholder disbursement. In the 3 Baltic states family firms are most represented (over 35% of total number of firms) in wholesale trade, retail, transport, construction, forestry and wood manufacturing sectors. There are also differences between countries and their family and non-family firm splits between sectors (Appendix D).

In all countries there is a strong presence in the following sectors: construction (at least 40% in each country), forestry (at least 47% excluding Lithuania where there are less than 70 total companies in the sector), transport and logistics (at least 36%), civil engineering (at least 35%), and wholesale trade (at least 38% excluding Lithuania, and at least 30% including Lithuania). Some industries that are least represented in all countries: real estate and rental industries (23% combined family firms of total firms in all countries), computer programming (22% combined), health (14% combined), and utilities (4% combined). The presence of family firms in these industries will help to put the results in perspective, not generalizing them to all industries but considering the industries with more extreme splits between family and non-family firms.

**Table 2.** Total number of firms and percent of family firms and non-family firms by description of NACE2 codes. Percent of firms in the industry is computed as the number of a type of firms divided by the total. Table created by the authors. Total number of identified industries: 16296.

| NACE2 | Description | All firms | % of family | % of non-family |
|---|---|---|---|---|
| 46 | Wholesale trade, except of motor vehicles and motorcycles | 3654 | 38% | 62% |
| 47 | Retail trade, except of motor vehicles and motorcycles | 1132 | 41% | 59% |
| 68 | Real estate activities | 936 | 22% | 78% |
| 49 | Land transport and transport via pipelines | 836 | 46% | 54% |
| 52 | Warehousing and support activities for transportation | 807 | 30% | 70% |
| 1 | Crop and animal production, hunting and related service activities | 717 | 29% | 71% |
| 41 | Construction of buildings | 627 | 45% | 55% |
| 45 | Wholesale and retail trade and repair of motor vehicles and motorcycles | 586 | 34% | 66% |
| 43 | Specialised construction activities | 430 | 49% | 51% |
| 16 | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 411 | 37% | 63% |
| 62 | Computer programming, consultancy and related activities | 381 | 22% | 78% |
| 25 | Manufacture of fabricated metal products, except machinery and equipment | 380 | 35% | 65% |
| 10 | Manufacture of food products | 368 | 35% | 65% |
| 42 | Civil engineering | 326 | 40% | 60% |
| 86 | Human health activities | 308 | 14% | 86% |
| 35 | Electricity, gas, steam and air conditioning supply | 241 | 4% | 96% |
| 70 | Activities of head offices; management consultancy activities | 203 | 23% | 77% |
| 31 | Manufacture of furniture | 199 | 40% | 60% |
| 77 | Rental and leasing activities | 197 | 23% | 77% |
| 2 | Forestry and logging | 187 | 47% | 53% |
| 22 | Manufacture of rubber and plastic products | 156 | 29% | 71% |
|  | Other industries (with less than 150 firms) | 3214 | 29% | 71% |

Upon closer examination of return on assets using both net income and EBIT divided by assets or ROA and OROA for the period preceding the 2020-2021 crisis (2016-2019) and during the crisis, a notable observation arises: contrary to our expectations all companies show an increase in performance in the crisis period. Non-family firms exhibit higher growth in OROA and ROA during the crisis, with 1.4 percentage points increase of OROA and 1.31 percentage points increase in ROA, while family firms experience an increase about twice as small in OROA and ROA, with an increase of 0.72 p.p and 0.75 p.p, respectively. It would have been anticipated that all firms would exhibit lower return on assets during the crisis, in comparison to the preceding years. Further analysis of group differences will be conducted in subsequent sections.

Furthermore, Table 3 reveals that family firms exhibit superior performance compared to non-family firms in both time periods. However, the nature of this outperformance differs between stable economic conditions and the Covid-19 crisis. Prior to the crisis, family firms outperform non-family firms by a margin of 2.13 p.p. and 2.1 p.p. in terms of OROA and ROA, respectively. In contrast, during the crisis, family firms demonstrated a narrower outperformance margin, with 1.45 p.p. and 1.54 p.p. for OROA and ROA, respectively.

**Table 3.** Performance measures mean univariate difference tests and numbers of firm-year observations before and after the 2020-2021 crisis. Firm-year observations. OROA and ROA outliers larger than 99th percentile and smaller than 1st percentile were winsorized. Table created by the authors.

| | | Family firms (I) | | | Non-family firms (II) | | | | Difference in Mean | | Difference in Median | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Median | Mean | Std. Dev. | Obs | Median | Mean | Std. Dev. | (I)-(II) | | (I)-(II) | |
| *Before crisis 2016-2019* | | | | | | | | | | | | |
| *OROA* | 18899 | 7.807 | 11.27 | 16.97 | 36996 | 6.341 | 9.14 | 16.39 | 2.13 | *** | 1.466 | *** |
| *ROA* | 18908 | 6.795 | 9.85 | 16.23 | 36967 | 5.444 | 7.75 | 15.62 | 2.1 | *** | 1.351 | *** |
| *During crisis 2020-2021* | | | | | | | | | | | | |
| *OROA* | 9382 | 9.162 | 11.99 | 16.86 | 19907 | 7.478 | 10.54 | 17.04 | 1.45 | *** | 1.684 | *** |
| *ROA* | 9383 | 8.141 | 10.6 | 16.17 | 19891 | 6.635 | 9.06 | 16.19 | 1.54 | *** | 1.506 | *** |
| *During - before* | | | | | | | | | | | | |
| *OROA* | | 1.355 | 0.72 | | | 1.137 | 1.4 | | | | | |
| *ROA* | | 1.346 | 0.75 | | | 1.191 | 1.31 | | | | | |

***, **, * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Table 4 represents the country performance measure (OROA) means and the differences in them similarly to Table 1 but focusing on different periods and the performance measures. All the country means except for Lithuania in 2020-2021 period for family and non-family firms are different at 99% confidence interval. As discussed above, Latvian family firms seem to be doing the best performance-wise, which is the case both before and during the Covid-19 crisis. Looking at differences between the periods, Latvian non-family firms increased their performance by 1.57 p.p. while family firms by 2.22 p.p. In Lithuania the performance also increased for both groups, but it increased more for non-family firms, and in the 2020-2021 period the difference in OROA was 0.29 p.p. and not statistically significant. In Estonia, however, family firm performance dropped by 0.74 p.p., while non-family firm performance only marginally increased during the crisis, and family firms still outperformed by 1.24 p.p. in the latter period. Overall, each country shows that family firms perform better on average whether it is during the crisis or not.

**Table 4.** Descriptive statistics of the dependent variables (ROA and OROA) and numbers of observations before and after the 2020-2021 crisis by countries. ROA and OROA outliers larger than 99th percentile and smaller than 1st percentile were winsorized. Firm-year observations. Differences in means and their significance are derived using one-sided T-tests. Table created by the authors.

Performance measure: OROA

| | All family firms (I) | | | Non-family firms (II) | | | | Difference in Mean | | Difference in Median | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Median | Mean | Std. Dev. | Obs | Median | Mean | Std. Dev. | (I) - (II) | | (I) - (II) | |
| *Before crisis 2016-2019* | | | | | | | | | | | | |
| *LV* | 6192 | 8.29 | 12.26 | 18.6 | 10644 | 5.89 | 8.83 | 17.41 | 3.43 | *** | 2.40 | *** |
| *LT* | 5962 | 7.14 | 9.96 | 13.29 | 14898 | 6.08 | 9.16 | 15.63 | 0.80 | *** | 1.06 | *** |
| *EE* | 6745 | 7.98 | 11.51 | 18.19 | 14898 | 6.96 | 9.42 | 15.63 | 2.35 | *** | 1.02 | *** |
| *During crisis 2020-2021* | | | | | | | | | | | | |
| *LV* | 2408 | 11.21 | 14.48 | 18.48 | 4375 | 7.72 | 10.4 | 17.56 | 4.08 | *** | 3.49 | *** |
| *LT* | 3378 | 8.86 | 11.52 | 13.99 | 9598 | 7.52 | 11.23 | 17.15 | 0.29 | | 1.34 | *** |
| *EE* | 3596 | 8.15 | 10.77 | 17.97 | 5934 | 7.33 | 9.53 | 16.42 | 1.24 | *** | 0.82 | *** |
| *During - before* | | | | | | | | | | | | |
| *LV* | | 2.92 | 2.22 | | | 1.83 | 1.57 | | | | | |
| *LT* | | 1.72 | 1.56 | | | 1.44 | 2.07 | | | | | |
| *EE* | | 0.17 | -0.74 | | | 0.37 | 0.112 | | | | | |

***, **, * indicate statistical significance at 0.01, 0.05, and 0.10 levels, respectively

### 4.2. Performance measure

After controlling for firm fixed effects and time fixed effects (Table 5), in the sample with all countries the crisis dummy interaction with the Family dummy creates 0.54 p.p. higher ORAO performance. Examining the countries individually, family firms outperform non-family firms during the crisis by 2.33 p.p. in Latvia, and by 1.46 p.p. in Lithuania at. In Estonia, however, family firms create a negative effect on performance during the crisis of 1.21 p.p. lower OROA with firm invariant characteristics.

While it would be expected that in countries that are geographically close, similar in size, have a similar family/non-family split the effect would be similar during, but it is not the case for Estonian firms in our sample. However, looking at overall OROA trends over the sample period (Figures 2. - 4.), 2021 was the year with a sharp drop in average operating return on assets in

Estonia and Lithuania, and in Estonia family firms were bearing the biggest drop. It might be the case that the true effects of Covid-19 only being represented in later years - evidence for which we can see in 2021 drop in performance.

From control variables, leverage is negatively related to performance in a similar manner for all countries, and size has a positive effect - significantly more so in Lithuania. These results are in line with previous findings of Anderson and Reeb (2003), Zhou et al. (2017). Miller et al. (2007) and Villalonga and Amit (2006).

**Table 5.** Firm-fixed effects regression on panel data. OROA as dependent variable on crisis dummy, crisis and family interaction coefficient, control variables: size, and leverage. Firm invariant and time invariant unobserved effects are fixed. Firm-year observations. Dependent variable outliers larger than 99th percentile and smaller than 1st percentile were winsorized. Companies and years are fixed in the panel data. Table created by the authors.

| | Dependent Variable: OROA | | | |
|---|---|---|---|---|
| | LV | EE | LT | All |
| *Family*Crisis* | 2.329*** | -1.214*** | 1.458*** | 0.540*** |
| | (0.36) | (0.30) | (0.42) | (0.21) |
| *Debt-to-assets* | -0.203*** | -0.214*** | -0.152*** | -0.203*** |
| | (0.01) | (0.01) | (0.01) | (0.00) |
| *Size* | 0.358*** | 0.216** | 0.576*** | 0.304*** |
| | (0.10) | (0.11) | (0.14) | (0.06) |
| Within R^2 | 0.055 | 0.06 | 0.029 | 0.052 |
| N | 23,474 | 25,274 | 14,124 | 62,872 |

***, **, * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Examining the effect of firms being owned by families in more detail using pooled OLS regressions in single years (Table 6), the effect of families on company performance is clearly positive. In Latvia family firms generate 3.4 p.p. higher OROA throughout the period with all years showing evidence for that. In Lithuania the family effect generates 0.66 p.p. higher performance, but looking at individual years the effect was found significant only in 2018 and 2021. Similarly to Lithuanian family firms, Estonian family firms generate a positive effect of 0.76 p.p. higher OROA, while individual years when it was found significant are 2016 and 2017. Overall the results are in line from what we expected after looking at figures 3.,4. and 5. The

intercept represents the effect of a non-family firm and agricultural industry, additionally, in the "All years" regression it represents 2016.

Compared to firm fixed effects regressions, industry fixed effects show similar picture regarding family firms in different periods, namely, if we compare the 2020-2021 period to other years, the results are in line with the fixed effects regression. We return to the differences between the two regressions in the robustness section. When examining individual years, Lithuanian family firms have a negative effect only 2019 onwards, while when controlling for years, the negative effect applies to all firms, which was not the case in the firm fixed effects regression implying some of the crisis effect might be explained by the family dummy due to missing additional explanatory variables. Estonian family firms, on the other hand, do not produce a statistically significant effect which can be explained by the sharp drop in family firm performance in 2017 and in 2021 (Figure 5). Additionally, if we run the same regression, but use different dummies, we see that non-family firms also increased their performance during the crisis (Appendix E).

**Table 6** Pooled OLS regression on panel data. OROA as the dependent variable on family firm status, industry dummies, country dummies, year dummies in the "All years" regression, and control variables: age, size, and leverage. Dependent variable outliers larger than 99th percentile and smaller than 1st percentile were winsorized. Companies and years are fixed in the panel data. ***, **, * indicate significance at the 0.01, 0.05 and 0.1 levels, respectively. Table created by the authors.

| Latvia | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | All years |
|---|---|---|---|---|---|---|---|
| Family dummy | 3.547*** | 2.678*** | 4.472*** | 2.639*** | 3.528*** | 1.756** | 3.408*** |
| | (0.65) | (0.64) | (0.64) | (0.58) | (0.60) | (0.80) | (0.29) |
| Age | -0.085** | -0.136*** | -0.163*** | -0.120*** | -0.211*** | -0.063* | -0.142*** |
| | (0.04) | (0.04) | (0.04) | (0.03) | (0.03) | (0.04) | (0.02) |
| Size | 0.720** | 0.293 | -1.091*** | -1.405*** | -1.522*** | -0.862** | -0.384** |
| | (0.30) | (0.29) | (0.32) | (0.24) | (0.27) | (0.35) | (0.17) |
| Leverage | -0.155*** | -0.190*** | -0.181*** | -0.178*** | -0.163*** | -0.139*** | -0.176*** |
| | (0.01) | (0.01) | (0.02) | (0.01) | (0.02) | (0.02) | (0.01) |
| Intercept | 2.437 | 12.471*** | 30.049*** | 36.620*** | 41.978*** | 26.141*** | 19.377*** |
| | (4.50) | (4.32) | (4.47) | (3.74) | (4.16) | (5.45) | (2.49) |
| N | 3,977 | 4,141 | 4,256 | 4,364 | 4,406 | 2,330 | 23,474 |
| R^2 | 0.101 | 0.106 | 0.151 | 0.139 | 0.126 | 0.156 | 0.106 |
| Adjusted R^2 | 0.082 | 0.089 | 0.135 | 0.123 | 0.110 | 0.126 | 0.103 |
| Lithuania | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | All years |
| Family dummy | -0.049 | -0.463 | 0.990* | 0.602 | 0.912 | 1.523** | 0.657** |
| | (0.62) | (0.58) | (0.56) | (0.60) | (0.67) | (0.66) | (0.30) |
| Age | -0.207*** | -0.145*** | -0.174*** | -0.213*** | -0.226*** | -0.240*** | -0.204*** |
| | (0.05) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.02) |
| Size | 0.14 | 0.061 | 0.844*** | 0.384 | -0.616** | 0.612** | 0.238* |
| | (0.29) | (0.30) | (0.31) | (0.27) | (0.26) | (0.28) | (0.13) |
| Leverage | -0.107*** | -0.119*** | -0.112*** | -0.128*** | -0.119*** | -0.144*** | -0.123*** |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.01) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Intercept* | 8.598* | 10.224** | -5.513 | 3.199 | 22.310*** | 3.135 | 6.958*** |
| | (4.70) | (4.65) | (5.03) | (4.43) | (4.26) | (4.57) | (2.53) |
| N | 2,038 | 2,079 | 2,205 | 6,430 | 6,565 | 6,384 | 14,124 |
| R^2 | 0.141 | 0.120 | 0.142 | 0.227 | 0.231 | 0.189 | 0.111 |
| Adjusted R^2 | 0.106 | 0.085 | 0.109 | 0.217 | 0.221 | 0.179 | 0.106 |
| *Estonia* | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | All years |
| *Family dummy* | 1.213** | 1.253** | 0.801 | 0.64 | 0.784 | -0.025 | 0.760*** |
| | (0.52) | (0.55) | (0.53) | (0.49) | (0.58) | (0.52) | (0.24) |
| *Age* | -0.180*** | -0.183*** | -0.198*** | -0.184*** | -0.137*** | -0.096*** | -0.163*** |
| | (0.03) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.01) |
| *Size* | -0.205 | -1.052*** | -0.721*** | -0.954*** | -0.933*** | -0.006 | -0.631*** |
| | (0.28) | (0.30) | (0.28) | (0.26) | (0.26) | (0.25) | (0.17) |
| *Leverage* | -0.161*** | -0.166*** | -0.153*** | -0.153*** | -0.150*** | -0.150*** | -0.157*** |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| *Intercept* | 14.033*** | 34.343*** | 25.519*** | 32.119*** | 29.113*** | 13.639*** | 23.930*** |
| | (4.18) | (4.65) | (4.12) | (3.90) | (3.96) | (3.99) | (2.54) |
| N | 3,898 | 4,056 | 4,190 | 4,335 | 4,518 | 4,277 | 25,274 |
| R^2 | 0.131 | 0.143 | 0.154 | 0.138 | 0.114 | 0.104 | 0.114 |
| Adjusted R^2 | 0.113 | 0.126 | 0.138 | 0.122 | 0.098 | 0.087 | 0.111 |

**4.3. Founder impact**

Examining differences between the largest Latvian founder and non-founder firms, we look at 200 firms of which 164 are founder firms and 36 are non-founder firms (in 2021). When looking at OROA and ROA (Table 7), on average, the founder firms performed better by a small margin than the firms that were not owned by founders before the crisis – 0.68 p.p. and 0.79 p.p., respectively, and also during the crisis by a margin of 0.19 p.p. and 0.14 p.p., respectively. This observation, although not statistically significant, signals that founder firms tend to perform better in calm times, but during crises they slightly lose their edge, which could also just be long-term thinking and it will pay off in the long-term. Non-founder firms managed to increase their OROA and ROA during the crisis more than the founder firms, which can be explained by a lesser attachment to the company and a higher willingness to sacrifice long-term survival for short-term gains by non-founder owners. Return on equity had decreased for both groups of firms, the means decreased much more for founder firms (by 1.26 p.p. compared to 0.25 p.p. decrease for non-founder firms), however, the medians were almost the same. Founder firms already before the crisis had lower ROE, which can be expected from a lower willingness or ability to leverage a company by the founder. Overall, the fact that 82% of the 200 largest family firms in Latvia are still owned by their founders implies that a generation ownership change has not yet taken place among the largest Latvian family firms.

Examining the sample closer, in 2021 out of 200 family firms, 113 were founder-controlled firms with no other family members present (Appendix F). Out of all founder firms, in 32 both the founder and the same generation family members (sibling(s) and/or spouse(s)) were present and in 16 - both the founder and the second generation (a person that is at least 18 years younger than the founder). Only a small proportion of all family firms - 3 out of 200 - were controlled by the founder and family members from various generations. As for the non-founder firms, the largest part - 19 out of 37 were not from the founder's family (although the firm is still a family firm, it is not a founding family firm), while 16 were second generation members from the same family and only 1 was a family member of the same generation as the founder. In 2021, only 18% of all 200 family firms have someone from the second generation holding a part of ownership, which is a characteristic of relatively young economies as the generation change has

not happened yet in most firms. Additional information about the proportions of the second generation being present in the family firm can be found in Appendix G.

Wilcoxon rank sum test suggests there is no statistically significant difference in the median variable. Nevertheless, these values might be a close representation of the true picture, as the sample is small, and differences between the performance variables are not expected to be big among the biggest companies.

**Table 7** Founder and non-founder firm performance measures mean univariate difference tests and numbers of observations before and after the 2020-2021 crisis. Out of 154 founder firms 137 had founders holding 50% or more of company shares. Outliers larger than 99th percentile and smaller than 1st percentile were winsorized. Table created by the authors.

| | | Founder family firms (I) | | | | | | Non-founder family firms (II) | | | | | Difference in Mean | Difference in Median |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Median | Mean | Std. Dev. | Min | Max | Obs | Median | Mean | Std. Dev. | Min | Max | (I)-(II) | (I)-(II) |
| *Bbefore crisis 2016-2019* | | | | | | | | | | | | | | |
| *OROA* | 614 | 7.09 | 9.68 | 10.88 | -14.26 | 54.49 | 143 | 6.13 | 9 | 9.99 | -14.26 | 49.02 | 0.68 | 0.96 |
| *ROA* | 614 | 6.33 | 8.96 | 11.13 | -16.52 | 52.87 | 143 | 5.29 | 8.17 | 9.73 | -16.52 | 49.85 | 0.79 | 1.04 |
| *ROE* | 585 | 13.39 | 19.12 | 23.1 | -48.41 | 99.68 | 140 | 15.02 | 20.87 | 21.1 | -15.41 | 99.68 | -1.75 | -1.63 |
| *During crisis 2020-2021* | | | | | | | | | | | | | | |
| *OROA* | 230 | 8.069 | 10.21 | 10.67 | -14.26 | 54.49 | 51 | 8.48 | 10.02 | 8.9 | -14.26 | 34.27 | 0.19 | -0.41 |
| *ROA* | 229 | 7.561 | 9.58 | 10.28 | -16.52 | 52.87 | 51 | 7.74 | 9.44 | 9.25 | -16.52 | 34.24 | 0.14 | -0.18 |
| *ROE* | 225 | 15.45 | 17.86 | 20.18 | -48.41 | 99.68 | 48 | 17.12 | 20.62 | 18.33 | -10.83 | 99.68 | -2.76 | -1.67 |
| *During - before* | | | | | | | | | | | | | | |
| *OROA* | | 0.979 | 0.53 | | | | | 2.35 | 1.02 | | | | -0.49 | -1.37 |
| *ROA* | | 1.231 | 0.62 | | | | | 2.45 | 1.27 | | | | -0.65 | -1.22 |
| *ROE* | | 2.06 | -1.26 | | | | | 2 | -0.25 | | | | -1.01 | -0.04 |
| *All years* | | | | | | | | | | | | | | |
| *OROA* | 844 | 7.28 | 9.82 | 10.82 | -14.26 | 54.49 | 194 | 6.558 | 9.27 | 9.7 | -14.26 | | 0.55 | 0.72 |
| *ROA* | 843 | 6.736 | 9.12 | 10.9 | -16.52 | 52.87 | 194 | 6.097 | 8.5 | 9.6 | -16.52 | | 0.62 | 0.64 |
| *ROE* | 810 | 14.365 | 18.77 | 22.32 | -48.41 | 99.68 | 188 | 15.865 | 20.81 | 20.38 | -15.41 | | -2.04 | -1.50 |
| *Age* | 974 | 25 | 22.64 | 7.45 | 7 | 32 | 222 | 25 | 23.7 | 5.72 | 12 | | -1.06 | 0 |

**4.4. Robustness tests**

The Breusch-Pagan Lagrange multiplier test and Hausman test both show a p-value lower than 0.01 which indicates that the fixed effects regression will be more accurate in our analysis. Random effects model is still used to check robustness of the fixed effects model by comparing the coefficient significance and the standard errors, where we find the fixed effects model as robust. Variance inflation factor (VIF) test is performed to check multicollinearity between the explanatory variables, there is no significant correlation between the explanatory variables (Appendix H).

We also check robustness with a different industry fixed effects regression (Appendix E). We create 4 dummies: family dummy before and during crisis, and non-family dummies before and during crisis, add them to the industry fixed effects regression and regress them on OROA. Results are consistent with the industry fixed effects regression, and very close to what we could see in the firm fixed effects regression. We still do not see the effect of family firms in Estonia during crisis as negative like we see in firm fixed effects, only insignificant, but that is likely due to other firm-specific factors, which industries and control variables do not encompass.

# 5. Discussion

Observing the sample, we see that family firms are roughly one third of the firms in the Baltics, and there is a similar number of family firms in all 3 countries - around 1700 (Appendix C). The largest family firm percentage in a country from the Baltic firm sample is in Estonia with about 38% of the total number of firms, closely followed by Latvia with 37%. Lithuania has the smallest percentage - 26% because there is a larger number of non-family firms. It is also worth noting that Lithuanian private company data quality is the weakest of the three countries. While being similar in many aspects, such as becoming independent countries rather recently, similarity in size and geographical location in European map, the three Baltic countries show a different family firm concentration and performance.

Overall, the results show a similar tendency as many previous studies, such as Anderson and Reeb (2003), Eugster and Isakov (2019), Allouche et al. (2008), implying that family firms perform better compared to non-family firms. Our results are consistent with a meta-analysis conducted by Wagner et al. (2015) on this subject, which revealed that in studies using ROA as a performance measure, 73.7% of them exhibited a positive impact associated with being a family firm. Moreover, the disparity between ROA and ROA for family firms is statistically significant in both the pre-crisis and crisis periods. -

To see how this difference is impacted by the economic situation, we compare the differences in means between the two periods. While family firms still performed better than non-family firms, the Covid-19 crisis had a decreasing effect on their superiority of family versus non-family firms with OROA- dropping from 2.13 p.p. in the pre-crisis period to 1.45 p.p. during 2020-2021. Meta study by Hansen et al. (2020) finds similar results – procyclical behavior of family firms, meaning that during economic downturns they perform worse; however, the study implies that just by a slight margin. We analyzed the different industries and their proportion of family and non-family firms to understand possible reasons for family firm superiority decrease during the crisis and found that the computer programming, consultancy, and related activities sector - which had the largest positive effect due to the Covid-19 crisis and countries' shift towards online-based solutions - is primarily represented by non-family firms. On the other hand, industries that were negatively impacted during the Covid-19 crisis had a higher proportion of family firms from the entire sample.

Our regression analysis shows that during the crisis, family firms had a positive effect on operating return on assets (OROA), with an increase of 0.54 percentage points across all countries. The finding is consistent with the work of Anderson and Reeb (2003), and Villalonga and Amit (2006), who also found that family firms exhibit superior performance, albeit in much larger firms in the US. Due to significant differences between countries' performance means, we examined firm performance separately in the three Baltic countries. Only in Estonia family firms experienced a decline, 1.21 p.p. lower OROA during the crisis. In Latvia, family firms generated the highest OROA during the crisis, with an increase of over 2.3 percentage points, and in Lithuania, the increase was 1.46 percentage points. The superior results come from family ownership, which likely forms a stronger attachment to firm long-term success instead of following short-term gains. Another explanation for the superior performance previously alluded to by Zhou et al (2017) is better compensation.

We further verify these results using industry fixed effects regressions with clustered errors, and find that family firms outperform non-family firms in each country. If we look at each year individually, however, we find some significant differences. Latvian family firms outperform non-family firms every year, Lithuanian family firms only in 2018 and 2021, and Estonian family firms only in 2016 and 2017. These results are so far consistent with the firm fixed effects regression. Additionally, we find that non-family firms also increase their performance in crisis, except for Estonia where during the crisis neither of the groups experienced significant change compared to non-family firms before the crisis. Although the crisis result is contradictory to the meaning of crisis, it has to be acknowledged that the Covid-19 crisis was a more complex phenomenon, and did not affect all firms and countries the same way, having many diverse effects on different players in the economy. There is also a possibility that the true negative effects could come with a time lag.

Dividing the performance differences into pre-crisis and crisis periods, if we look at the decrease of outperformance of family firms, it can also be explained by the nature of family firms - willingness to sacrifice short-term gain for long-term prosperity. The other reason as to why family firms perform better overall is because most family firms have founders as owners since previous literature states that founder family firms are the ones that generate the majority of superior performance. Although data about founder status for all Baltic firms was not

available to us, we collected our own dataset from largest Latvian family firms and saw that founder firms slightly outperform non-founder firms both before the crisis and during the crisis.

Regarding the second hypothesis of how firm performance differed within the family firm sample, we find that founder family firms during the Covid-19 crisis performed better compared to non-founder family firms, but there is no statistical significance of the differences and the data sample is rather small. Although our findings are not confirmed by the previous literature such as Zhou et al. (2017) as founder superior performance was not statistically significant in our paper, by increasing the sample, there might be an avenue for future research to see if the superior performance is driven by founder firms. Furthermore, since the mean company age is around 19 years, we can expect that the founders would still mostly be around, at least in the family firms, and that is true in the case of our sample as 82% of all family firms are founder family firms. Thus, it might be too early to conduct studies with splits of founders and non-founders with high probability of most family firms being founder firms, but with proper record-keeping it could lead to interesting studies in the future about the same topic.

## 5.1. Limitations

A limitation that our paper faces is that our family firm definition is family firm identification accuracy. Family firms in our sample are based on the surname, which can sometimes be changed, or a person with the same surname could come to a company. The same is true for the sample of founder firms. Currently this is the only reliable way to get information about family firms apart from manual data collection which is not feasible for our sample size.

Additionally, because we look at private firms in small countries, our sample might be missing some important control variables such as specific investments or expenses that differentiate firms such as R&D as percentage of sales, or corporate structure differences. Similarly we cannot assess market-based dependent values such as Tobin's Q that would come from public companies. Although in the two stages of our regression analysis we control either for firm time-invariant differences or industry and country differences, adding additional controls could improve our analysis by rendering the findings more generalizable.

Lastly, our founder analysis was limited by the number of firms examined due to the manual nature of data extraction, and we only looked at Latvian firms. We did not include regression analysis in the paper as it yielded insignificant results due to both a small sample size and missing observations. It is hard to say if the regression analysis would yield significant effects if the sample was larger as the differences between the largest Latvian family firms when grouped by founder or non-founder status are small. In addition, we only looked at the Latvian founder firms, and it would be valuable to examine Lithuania and Estonia as the company registration location has implications from our analysis.

## 6. Conclusion

This paper analyzes a sample of Baltic firms with revenues above 2 million EUR, divided into family and non-family firms, and compares their performance before and during the Covid-19 crisis. Results indicate that family firms outperform non-family firms in both periods, but the gap narrows during the crisis, which might be attributed to the industry split and the long-term thinking of family firms. Examining Latvia, Lithuania, and Estonia separately reveals that the overall effect of family firms is positive. We confirm the first hypothesis that family firms perform better than non-family firms during the Covid-19 crisis in the Baltics. Even though the coefficient is negative for Estonian family firms during the crisis, the effect of family firms is positive when analyzing the crisis period as across the Baltics and separately in Latvia and Lithuania. Furthermore, examination of the top 200 Latvian family firms' founder status reveals that founder family firms have higher return on assets before and after the crisis compared to non-founder family firms but due to a lack of statistical significance we cannot accept the second hypothesis. Despite the limited size of our sample due to manual data collection, our findings suggest that founder family firms may perform better before and during the Covid-19 crisis in Latvia. Additionally, we find that 82% of the 200 largest Latvian family firms are still owned by the original founders, signaling that generation change is yet to take place among the largest family firms in Latvia.

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# Appendices

## Appendix A. Previous research on family firm performance.

*Family versus non-family firm performance in previous research. Table created by the authors.*

| Research | FF under/over perform non-FF firms | Specifications | Reasons | Additional information |
|---|---|---|---|---|
| Anderson, R. C. & Reeb, D. M. (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. | Outperform | | Family **understands the business better** | Even better result if the CEO is a family member |
| Eugster, N. & Isakov, D. (2019). Founding family ownership, stock market returns, and agency problems. | Outperform | | Less **agency problems** limiting maximum firm performance | Higher returns if higher family control |
| Allouche, J., Amann, B., Jaussaud, J., & Kurashina, T. (2008). The Impact of Family Control on the Performance and Financial Characteristics of Family Versus Nonfamily Businesses in Japan: A Matched-Pair Investigation. | Outperform | | | Strongly controlled family firms have even better performance |
| Koji, K., Adhikary, B. K., & Tram, L. (2020). Corporate Governance and Firm Performance: A Comparative Analysis between Listed Family and Non-Family Firms in Japan. | Outperform | | Family firms want to ensure **sustainable growth instead of high returns in the short term** | Founder's descendants ensure better performance than the founder |
| Miller, D., Le Breton-Miller, I., Lester, R. H., & Cannella, A. A. (2007). Are family firms really superior performers? | No outperformance | Only lone founder firms outperformed | | |
| Guedes, M. J., Patel, P. C., Kowalkowski, C., & Oghazi, P. (2020). Family business, | Underperform | Manufacturing firms | **Lower level of servitization** (a shift from a | |

| servitization, and performance: Evidence from Portugal. | | | product-centric to a service-centric business) | |
|---|---|---|---|---|
| Villalonga, B.,& Amit, R. (2006). How do family ownership, control and management affect firm value? | Outperform | Only when the founder is the CEO or Chairman with a hired CEO | **Agency costs** are lower (conflict between family and non-family shareholders for family firms is lower than owner-manager conflict in non-family firms) | No overperformance if the founder's descendant is the CEO |
| Lins, K. V., Volpin, P., & Wagner, H. F. (2013). Does Family Control Matter? International Evidence from the 2008–2009 Financial Crisis. | Underperform | Only firms with high expected agency costs underperform | **Undiversified** shareholders of the firm leads to the firm trying to keep the control which might come at an expense of other metrics $\rightarrow$ **Underinvestment** private benefits of control explain family firm underperforming (because only firms with high expected agency costs underperform) | Survival of the family empire (for multi-firm family groups, to save a hard hit member of a group, all firms in the group suffer) |
| Minichilli, A., Brogi, M., & Calabrò, A. (2015). Weathering the Storm: Family Ownership, Governance, and Performance Through the Financial and Economic Crisis. | Outperform overall | Overall **outperform** BUT in crisis it is better to have more diversified ownership ($\rightarrow$ in a way implies that ff in crisis **underperform** if they have undiversified | **SEW** - family firms become risk-seeking during crisis when ownership is at stake | |

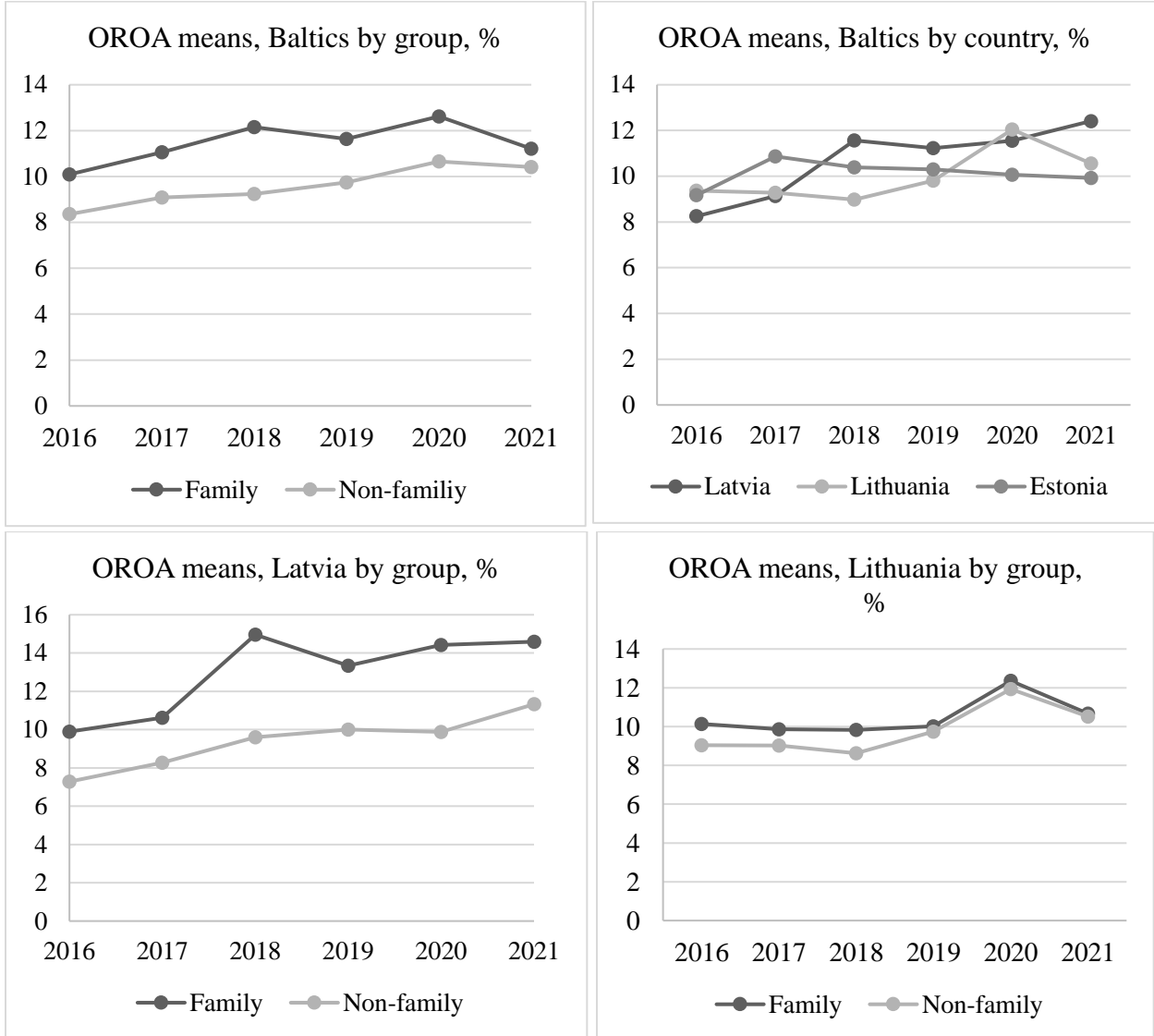| | | | | |
|---|---|---|---|---|
| | | ownership - **undiversified** → more ff characteristics) | | |
| Arrondo-Garcia, R., Fernandez-Mendez, C. and Menendez-Requejo, S. (2016). The growth and performance of family businesses during the global financial crisis: the role of the generation in control. | Technically, can say that firms with more ff characteristics underperform | 1st generation (more ff firm characteristics) underperform | **SEW** - more concerned with conserving the company to next generations, so short term financial aspects not as important (so financially underperform) | |
| Zhou, H., He, F., & Wang, Y. (2017). Did family firms perform better during the financial crisis? New insights from the S&P 500 firms. | Outperform | Only lone founder firms overperformed | **Less overinvestment** (*which technically could be the same as underinvestment*) either because of **fear of control loss** or **long term thinking** | The similarity between non-founder family firms and non-family firms might be explained by the fact that by time and changing generations, ff lose their ff values and characteristics - less intention to preserve SEW |
| Amann, B., & Jaussaud, J. (2012) Family and non-family business resilience in an economic downturn. | Better recovery & outperform | | Invest more because of **Long term thinking** | |

## Appendix B. Family firm distribution between countries.

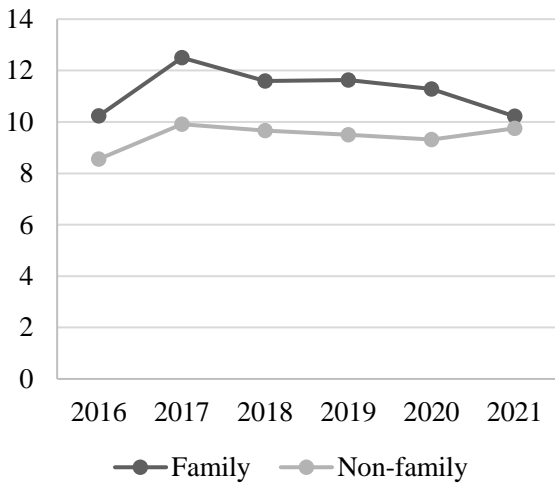*Family firm distribution between the sample countries. Table created by the authors.*

| Country | Family Firms | Non-Family Firms | Total | Family Firms as % of Total |
|---------|--------------|------------------|-------|----------------------------|
| LV | 1629 | 2805 | 4434 | 37% |
| LT | 1702 | 4924 | 6626 | 26% |
| EE | 1867 | 3043 | 4910 | 38% |
| Total | 5198 | 10772 | 15970 | 33% |

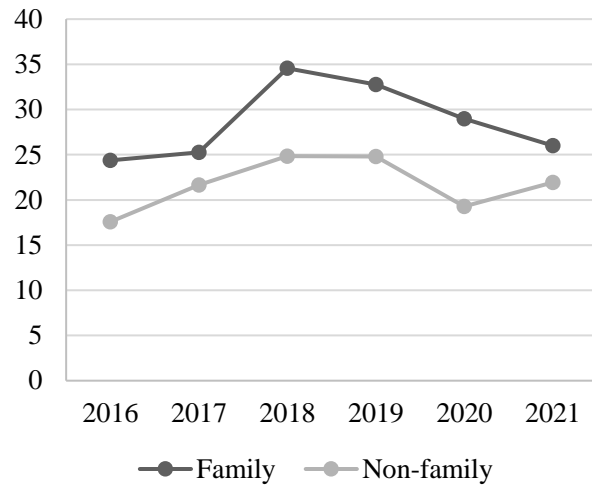# Appendix C. Visualized descriptive statistics.

*Mean values for the sample and by country individually throughout the sample years. Outliers are winsorized at the 1st and the 99th percentile. Graphs created by the authors.*



OROA means, Baltics by group, %



OROA means, Baltics by country, %



OROA means, Latvia by group, %



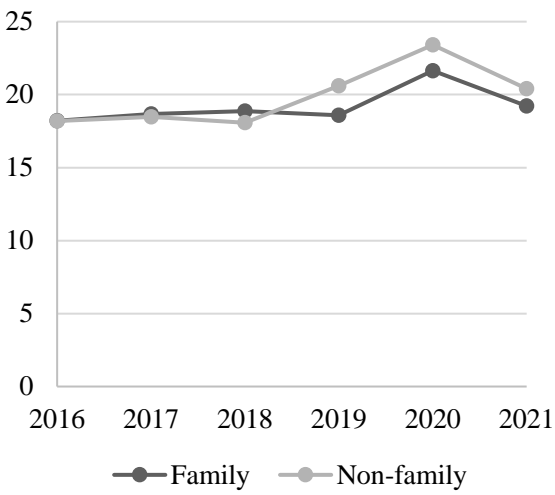OROA means, Lithuania by group, %

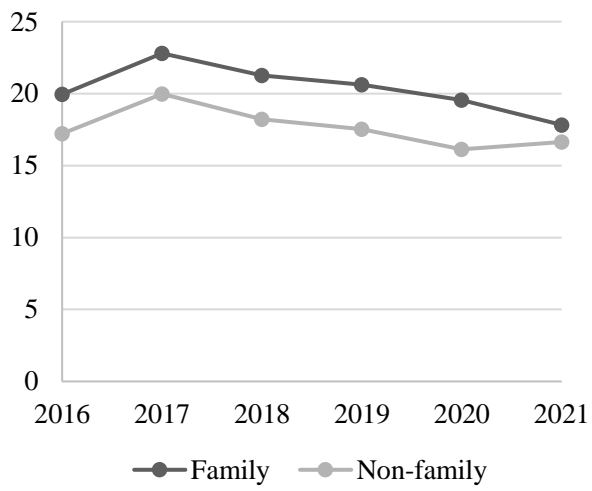OROA means, Estonia by group, %

ROE means, Latvia by group, %

ROE means, Lithuania by group, %

ROE means, Estonia by group, %

## Appendix D. Industry distribution between countries.

*Firm distribution in industries by countries. Sorted by % of family firms in the total sample (All countries). Table created by the authors.*

| NACE2 | Description | All countries | | Latvia | | Lithuania | | Estonia | |
|---|---|---|---|---|---|---|---|---|---|
| | | All firms | % of family | All firms | % of family | All firms | % of family | All firms | % of family |
| 43 | Specialised construction activities | 430 | 49% | 73 | 59% | 218 | 44% | 139 | 52% |
| 2 | Forestry and logging | 187 | 47% | 80 | 50% | 30 | 37% | 77 | 47% |
| 49 | Land transport and transport via pipelines | 836 | 46% | 214 | 57% | 464 | 36% | 158 | 58% |
| 41 | Construction of buildings | 627 | 45% | 161 | 53% | 286 | 40% | 180 | 45% |
| 47 | Retail trade, except of motor vehicles and motorcycles | 1132 | 41% | 338 | 46% | 438 | 33% | 356 | 48% |
| 42 | Civil engineering | 326 | 40% | 113 | 44% | 103 | 35% | 110 | 41% |
| 46 | Wholesale trade, except of motor vehicles and motorcycles | 3654 | 38% | 986 | 41% | 1549 | 31% | 1119 | 44% |
| 16 | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 411 | 37% | 142 | 42% | 116 | 41% | 153 | 29% |
| 10 | Manufacture of food products | 368 | 35% | 115 | 45% | 154 | 27% | 99 | 35% |
| 25 | Manufacture of fabricated metal products, except machinery and equipment | 380 | 35% | 102 | 29% | 114 | 29% | 164 | 42% |
| 45 | Wholesale and retail trade and repair of motor vehicles and motorcycles | 586 | 34% | 125 | 38% | 265 | 26% | 196 | 41% |
| 52 | Warehousing and support activities for transportation | 807 | 30% | 230 | 31% | 368 | 25% | 209 | 39% |
| 22 | Manufacture of rubber and plastic products | 156 | 29% | 27 | 33% | 81 | 31% | 48 | 25% |
| | Other industries (with less than 150 firms) | 3214 | 29% | 1135 | 29% | 1350 | 17% | 1285 | 26% |
| 1 | Crop and animal production, hunting and related service activities | 717 | 29% | 287 | 29% | 224 | 9% | 206 | 50% |
| 77 | Rental and leasing activities | 197 | 23% | 55 | 29% | 77 | 16% | 65 | 28% |
| 70 | Activities of head offices; management consultancy activities | 203 | 23% | 36 | 25% | 120 | 18% | 47 | 32% |
| 68 | Real estate activities | 936 | 22% | 289 | 21% | 284 | 15% | 363 | 28% |
| 62 | Computer programming, consultancy and related activities | 381 | 22% | 94 | 27% | 138 | 9% | 149 | 30% |
| 86 | Human health activities | 308 | 14% | 74 | 22% | 183 | 3% | 51 | 41% |
| 35 | Electricity, gas, steam and air conditioning supply | 241 | 4% | 93 | 6% | 86 | 2% | 62 | 3% |

*Biggest industries by total number of firms (less than 150) combined together into "other industries".*
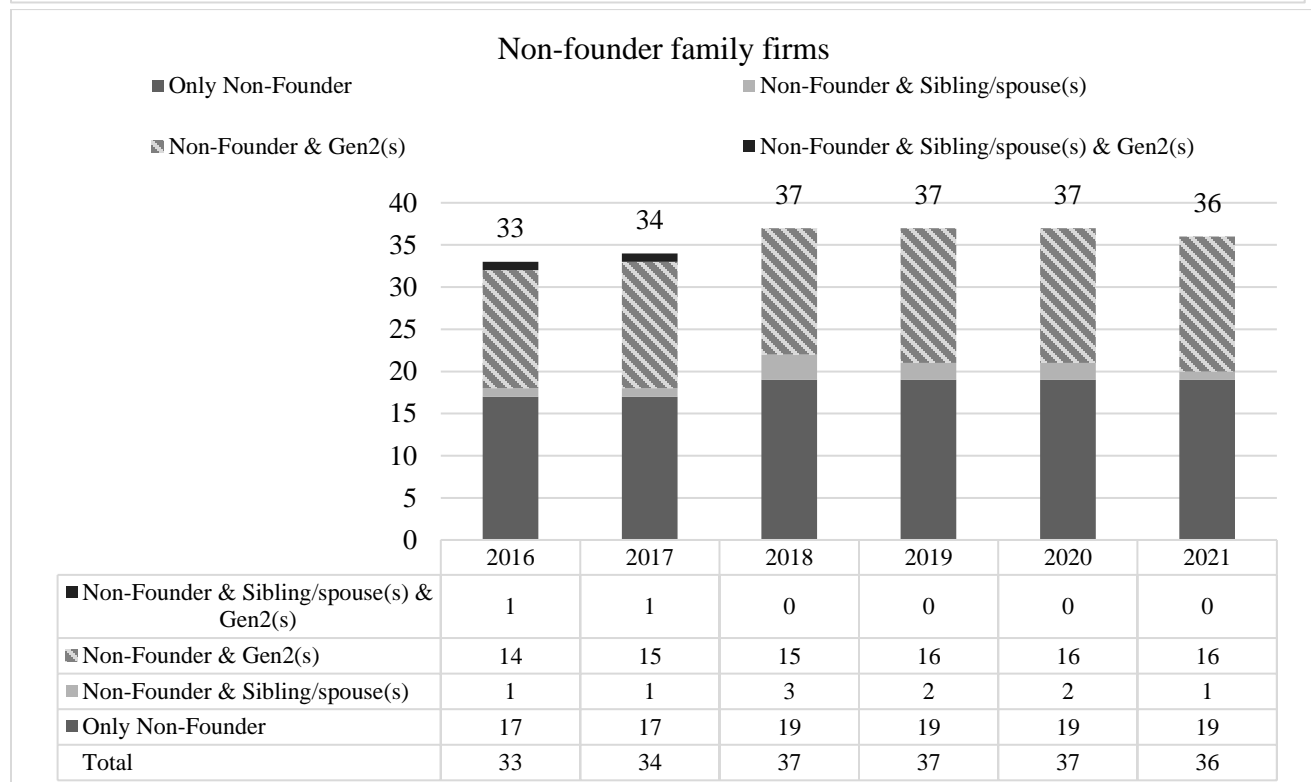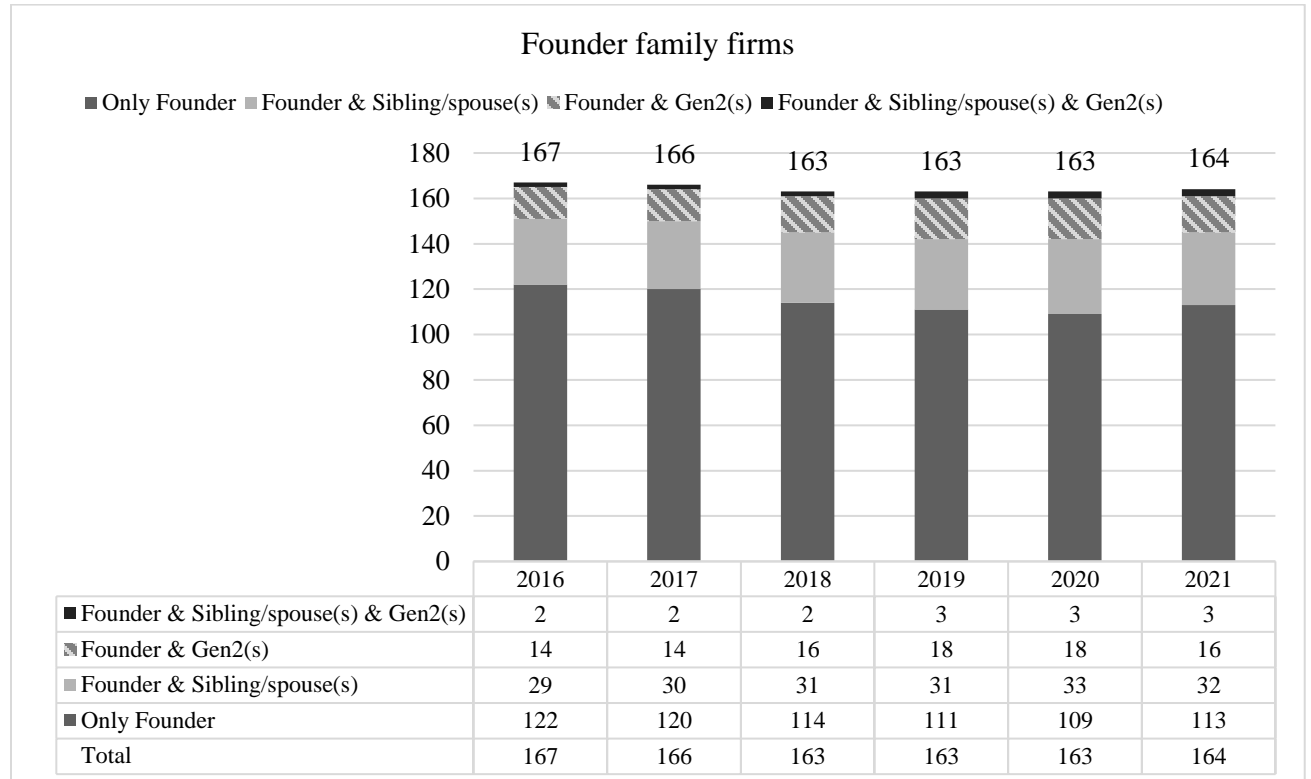
## Appendix E. Industry fixed effects on both groups.

*Clustered error regressions robustness test (Leverage = Debt/Assets instead of Liabilities/Assets as in the main regressions). Table created by the authors.*

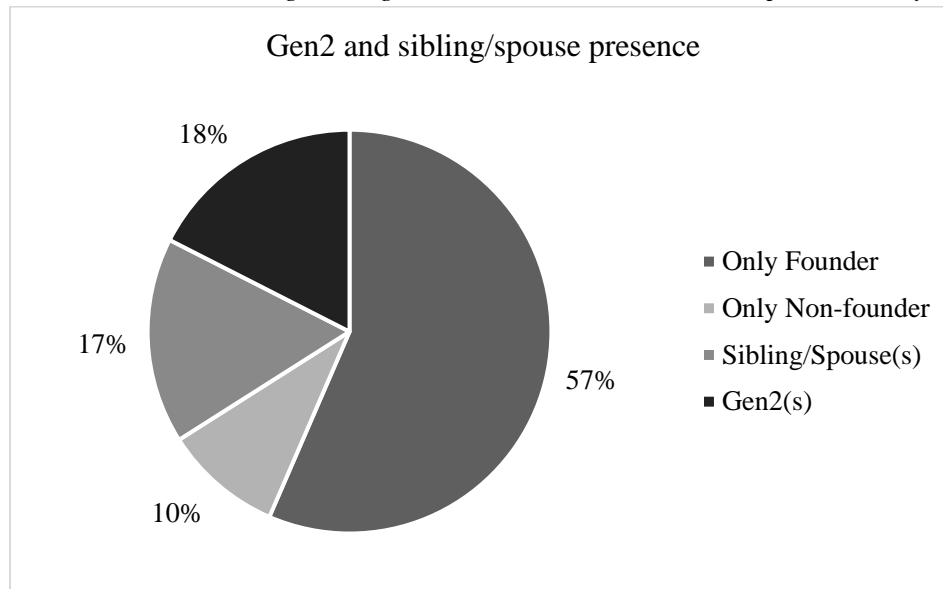|  | Dependant Variable: OROA | | | |
| --- | --- | --- | --- | --- |
|  | LV | EE | LT | All |
| *Family dummy (before crisis)* | 3.330*** | 1.114*** | 0.215 | 2.045*** |
|  | (0.29) | (0.26) | (0.35) | (0.17) |
| *Family dummy (during crisis)* | 4.759*** | -0.074 | 2.144*** | 2.182*** |
|  | (0.39) | (0.32) | (0.42) | (0.22) |
| *Non-family dummy (during crisis)* | 0.975*** | -0.200 | 0.776*** | 0.542*** |
|  | (0.31) | (0.26) | (0.25) | (0.16) |
| *Age* | -0.150*** | -0.164*** | -0.203*** | -0.168*** |
|  | (0.02) | (0.01) | (0.02) | (0.01) |
| *Size* | -0.304*** | -0.614*** | 0.228** | -0.317*** |
|  | (0.08) | (0.08) | (0.09) | (0.05) |
| *Debt-to-assets* | -0.178*** | -0.157*** | -0.123*** | -0.159*** |
|  | (0.01) | (0.01) | (0.01) | (0.00) |
| Within R^2 | 0.103 | 0.111 | 0.111 | 0.096 |
| N | 23,474 | 25,274 | 14,124 | 62,872 |

## Appendix F. Founder firm split.

*Latvian largest 200 (by assets in 2021) family firms split into founder and non-founder firms. Each group is further split to how much of the firm is owned by the founder's family. Graphs created by the authors.*

### Founder family firms

■ Only Founder  ■ Founder & Sibling/spouse(s)  ▨ Founder & Gen2(s)  ■ Founder & Sibling/spouse(s) & Gen2(s)

|  | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| ■ Founder & Sibling/spouse(s) & Gen2(s) | 2 | 2 | 2 | 3 | 3 | 3 |
| ▨ Founder & Gen2(s) | 14 | 14 | 16 | 18 | 18 | 16 |
| ■ Founder & Sibling/spouse(s) | 29 | 30 | 31 | 31 | 33 | 32 |
| ■ Only Founder | 122 | 120 | 114 | 111 | 109 | 113 |
| Total | 167 | 166 | 163 | 163 | 163 | 164 |

### Non-founder family firms

■ Only Non-Founder  ■ Non-Founder & Sibling/spouse(s)  ▨ Non-Founder & Gen2(s)  ■ Non-Founder & Sibling/spouse(s) & Gen2(s)

|  | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|
| ■ Non-Founder & Sibling/spouse(s) & Gen2(s) | 1 | 1 | 0 | 0 | 0 | 0 |
| ▨ Non-Founder & Gen2(s) | 14 | 15 | 15 | 16 | 16 | 16 |
| ■ Non-Founder & Sibling/spouse(s) | 1 | 1 | 3 | 2 | 2 | 1 |
| ■ Only Non-Founder | 17 | 17 | 19 | 19 | 19 | 19 |
| Total | 33 | 34 | 37 | 37 | 37 | 36 |

**Appendix G. 2<sup>nd</sup> generation participation in largest family firms.**

*Second generation and spouse/sibling ownership split in the largest Latvian family firms by assets. 3 firms where there were both a sibling and a gen2 were counted as Gen2. Graph created by the authors.*



Gen2 and sibling/spouse presence

- Only Founder
- Only Non-founder
- Sibling/Spouse(s)
- Gen2(s)

18%
17%
10%
57%

**Appendix H. VIF tests.**

*VIF test on the firm and industry fixed effects regressions. Table created by the authors.*

Firm fixed effects

| *Variable* | GVIF | Df | GVIF^(1/(2*Df)) |
|---|---|---|---|
| *Crisis* | 1.366 | 1 | 1.169 |
| *Size* | 1.270 | 1 | 1.127 |
| *Leverage* | 1.216 | 1 | 1.103 |
| *Country* | 1.188 | 2 | 1.044 |
| *Industry* | 1.513 | 80 | 1.003 |
| *Crisis\*Family* | 1.366 | 1 | 1.169 |

Industry fixed effects

| *Variable* | GVIF | Df | GVIF^(1/(2*Df)) |
|---|---|---|---|
| *FAMILY* | 1.113 | 1 | 1.055 |
| *Age* | 1.225 | 1 | 1.107 |
| *Size* | 1.268 | 1 | 1.126 |
| *Leverage* | 1.217 | 1 | 1.103 |
| *Country* | 1.190 | 2 | 1.044 |
| *Industry* | 1.496 | 80 | 1.003 |
| *Year* | 1.034 | 5 | 1.003 |