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Bachelor Thesis

# **Differences in ESG performance in family vs non-family firms: Evidence from Latvia**

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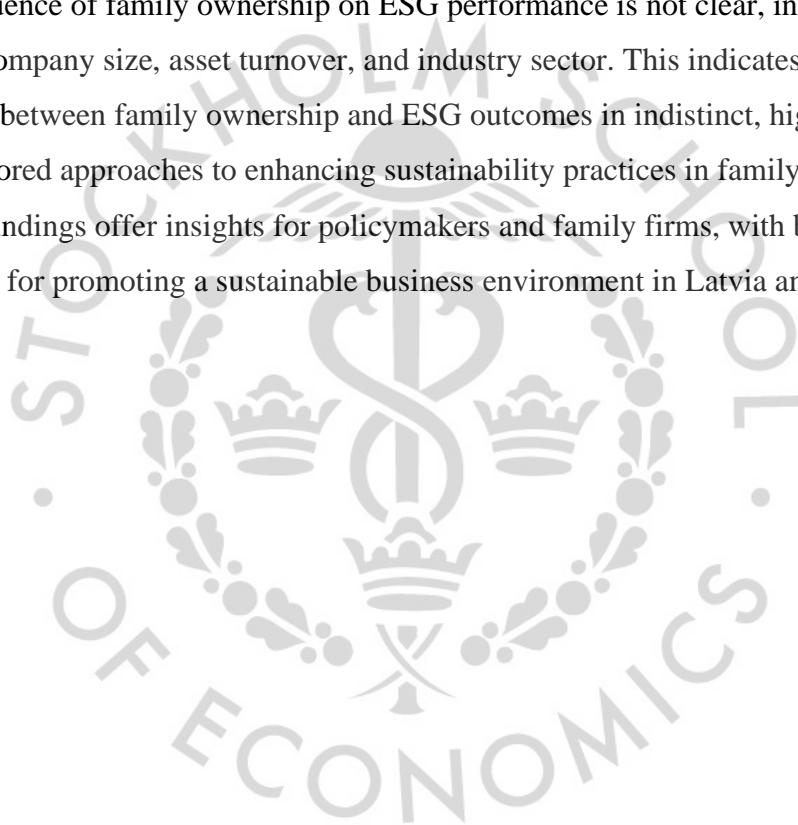
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## Abstract

This research explores how family ownership impacts Environmental, Social, and Governance (ESG) performance in Latvian companies, seeking to understand the interplay between corporate sustainability initiatives and the familial ownership of these businesses. Using a logit regression model and analysing a dataset of Latvian companies for various financial, governance, and industry factors, the study uses an innovative web-scraping tool to quantify ESG disclosures on company websites. Results indicate that the influence of family ownership on ESG performance is not clear, influenced mainly by company size, asset turnover, and industry sector. This indicates that the relationship between family ownership and ESG outcomes is indistinct, highlighting the need for tailored approaches to enhancing sustainability practices in family-owned firms. The findings offer insights for policymakers and family firms, with broader implications for promoting a sustainable business environment in Latvia and similar economies.



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## 1. Introduction

Research of family firms has emerged as a distinctive field, undergoing significant expansion in the 21<sup>st</sup> century (Bennedsen, et al. 2007; De Massis, et al. 2018). In broad terms, the majority of the studies have concentrated on two distinct types of research. Firstly, the focus has been on finding the distinctions between family enterprises and non-family enterprises. Secondly, research has delved into the variations in behaviours exhibited by different family firms (Zellweger et. al., 2010), which will be our approach in this research. There is a good merit for this emerging field of research - two thirds of the companies registered worldwide are family firms, which account for around 80% of global GDP. Family firms are a vital part of our economic landscape as they provide 50 - 80% of jobs in well more than half of the countries worldwide (De Massis et. al., 2018).

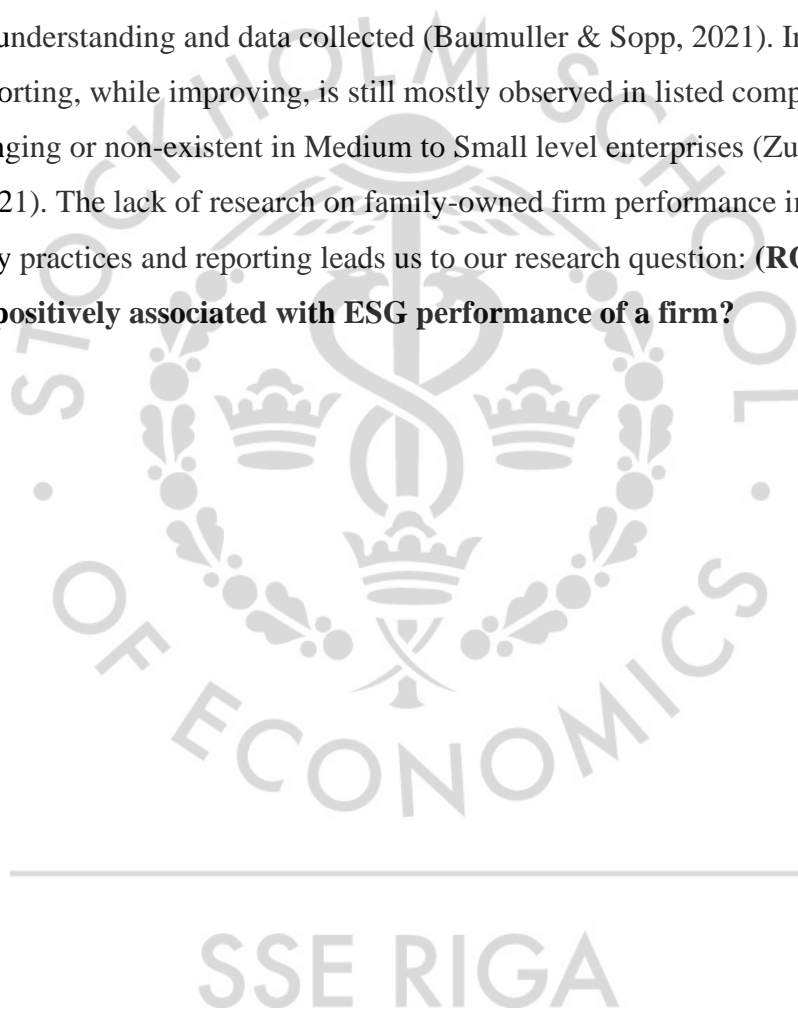
Family firms, prevalent globally, possess unique features that set them apart from other, non-family-owned business types. These differentiating characteristics include long-term orientation and legacy preservation, focus and investment in growth and lower employee turnover (Mandl, 2008). Additionally, family firms often have inner conflicts that are also affecting family enterprises (Mandl, 2008). The research about large family firms in the advanced world economies is quite extensive, however our focus is on sustainability in small to medium sized enterprises in the Baltics. Prior studies on family firms in the Baltics have concentrated on aspects like financial performance (Veldre & Ancāns, 2022; Gorenko & Juste, 2023) and succession (Klotiņš & Skrinda, 2023). However, there appears to be a gap in the literature regarding and sustainability within these firms.

Another relevant topic is sustainability and climate change mitigation. With the new, Renewable Energy Directive (RED III) and other regulations such as Corporate Sustainability Reporting Directive (European Parliament, 2023) and EU Taxonomy (European Commission, n.d. (a)), the European Union (EU) has set new and more ambitious goals for climate neutrality and sustainability with a common net zero emissions goal for the European Union by 2050 (European Commission, n.d. (b)). At the moment, firms have to think about sustainability in their business processes more than ever.

In the beginning of 2024, in Latvia, the Cabinet of Ministers passed a new law on sustainability disclosure that mandates certain large enterprises based in Latvia to

prepare a sustainability report from 2025. In the beginning, only the largest companies (50 million EUR revenue, more than 250 employees) will have to prepare sustainability reports for the year, however over the years, the number of companies, which will have to prepare sustainability reports will increase. For instance, from 2028, certain types of small and medium sized enterprises will have to publicly disclose companies' performance in sustainability. This is a direct implication that the topic of ESG and sustainability becomes increasingly relevant for Latvian firms.

The shift to non-financial, ESG reporting is a challenging transition as it requires a change in understanding and data collected (Baumuller & Sopp, 2021). In the Baltics, the ESG reporting, while improving, is still mostly observed in listed companies and quite challenging or non-existent in Medium to Small level enterprises (Zumente & Bistrova, 2021). The lack of research on family-owned firm performance in sustainability practices and reporting leads us to our research question: **(RQ) Is family ownership positively associated with ESG performance of a firm?**



## 2. Literature review

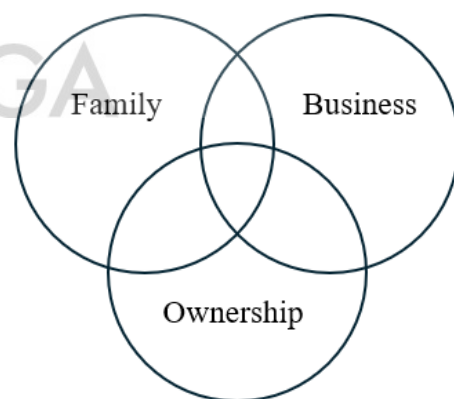
In this section, we provide a detailed overview of the current existing literature and explore potential distinctions in sustainability between family and non-family firms in the Baltics.

### 2.1. Definition

There is no universally accepted definition of family-owned firms; it varies based on the topic addressed in a paper and the nature of the research. A commonly used in practice description suggests that family firms are heterogeneous entities (Rau et al., 2019). Rau (2019) emphasizes the significance of recognizing the heterogeneity in family-owned companies. This diversity contributes to less predictable behaviour of these firms and results in increasingly inconsistent research findings regarding the behaviour of family firms.

Values are another key characteristic of family firms, as noted by Rau et al. (2019). Some researchers, like (Christman et al., 2012), argue that values are the distinguishing elements differentiating family-owned firms from non-family-owned firms and even among various family firms themselves, as values act as guiding principles for both decision-making and behaviour in family firms. Consequently, the values of family firms significantly influence their business strategy, firm functions, structure, and culture. These values have a direct impact on the performance of family firms, often giving a sustainable competitive advantage. Specifically, values contribute to enhanced firm performance, particularly in terms of long-term viability, as they provide a healthy environment for creation of a vision for the future and serve as reference points not only for the family owners but also for the management and employees in decision-making processes (Rau et al., 2019).

Tagiuri and Davis (1996) provided another notable description, and perhaps even a definition, of family firms. They identified that family firms primarily encompass three elements – Family, Business, and Ownership – which they depicted through the 3-Circle model in their article. The 3-Circle model illustrates three



*Figure 1 “3-Circle” model of family business. Created by authors. Based on Tagiuri and Davis (1996).*

interconnected and overlapping clusters of individuals within a family company. Each sector within these three overlapping groups is filled by an individual who holds a position in the structure of a family business. Individuals from different elements from the circle have different concerns. As a family member, one is more concerned about unity and wellbeing within the family, as an owner, one is more focused on firm profitability and growth, lastly as a manager, one is mostly interested in firm operational effectiveness. Each has their own symbol in the model, for instance, family members are marked as circles. One individual in the family firm can belong to multiple groups - one can be a family member, company owner, and manager of the company (Tagiuri, Davis, 1996).

**For this research paper, we define family firms as a company whose ownership of equity exceeds 50% by one or more members of the family identified by the shared last name and in which family holds at least one board seat. The definition of family firms in Latvia is taken from other recent research about family firms (Veldre & Ancāns 2022).** In addition, this definition is also supported by Taiguri and Davis (1996) in their 3-cycle model as it covers all the 3 dimensions covered in the model.

## ***2.2. Transition countries***

Most research on family firms has been conducted in developed economies, particularly in regions such as Western Europe and North America. These countries have generally experienced longer periods of economic development compared to Eastern European nations. The market situation in transition countries, especially those in the post-Soviet bloc, differs significantly. Post soviet countries have been independent and sovereign for a little more than 30 years, however most developed economies have been growing their economies steadily since World War 2, thus they have had 50 additional years of development. In Eastern Europe family firms and all enterprises in general are in their unique state of development. Firstly, as the markets are considerably smaller in Eastern European countries, therefore there are almost no large companies, all the research must be done about SMEs. Secondly, due to extensive privatization of large companies and the emergence of new market opportunities following the collapse of the Soviet Union, the majority of companies in Eastern Europe were established in the 1990s. As of 2023, these firms are at most approximately 30 years old. Subsequently, this means that most family firms have not gone through a



succession, which creates another layer of uncertainty about family firm futures (Duh, et al. 2006). According to Duh, et al. (2006) merely 30% of family businesses manage to endure succession into the second generation, with a considerable number experiencing failure shortly after the second generation assumes control.

The issue of succession failure in family enterprises presents a significant challenge, affecting not only the businesses and their employees but also the broader economic health. However, while there is some data on this phenomenon in developed economies, research and information regarding family firm succession in Eastern Europe is even more scarce, underscoring a notable gap in the understanding of these dynamics within this specific regional context. Westhead and Howorth (2006) highlight that in family businesses, it is usually the management practices, not who owns the company, that are linked to certain measures of business performance and goals beyond financial gains. This implies that even if the owners of the family business change, it might not greatly affect how the business operates.

Today's global society confronts issues distinct from those encountered a decade or two ago, with climate change and sustainability emerging as the latest critical topics. Consequently, drawing conclusions about the future prospects of family firms requires a more in-depth analysis, considering these contemporary challenges. Investigating the influence of evolving economic conditions on family enterprises and their performance is crucial. Consequently, this paper aims to provide insights into the ESG (Environmental, Social, and Governance) performance of family enterprises within a transitioning country, specifically Latvia.

### ***2.3. Differences between family and non-family firms***

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When examining the distinctions between family and non-family-owned firms, these differences can be broadly categorized into two types: tangible and intangible. The examination of ESG performance between family and non-family firms hinges on acknowledging the fundamental disparities that exist between these two types of entities.

#### ***Tangible: financial performance and growth***

Securing a competitive advantage is a challenging endeavour for companies in the always changing and intricate business landscape. Recognizing the factors influencing enhanced firm performance enables enterprises to leverage their unique

resources and capabilities more effectively. This insight aids in making strategic decisions that enhance their capacity to capitalize on future opportunities (Mazzi, 2011).

Anderson and Reeb's 2003 research, which focused on family firms within the S&P 500 index, revealed that family firms generally outperformed non-family firms. They also noted that approximately 30% of the firms listed on the S&P 500 index are family-owned enterprises. In their research, Anderson and Reed assess performance using metrics such as return on assets and Tobin's Q. Their findings predominantly indicate a positive and statistically significant correlation, suggesting that being a family firm is often associated with improved financial performance. Furthermore, Anderson and Reed discovered that when family ownership exceeds a specific threshold, the likelihood of the family firm becoming entrenched increases, consequently leading to a decline in overall financial performance.

Family firms are performing well during times of distress, family firms performed well during the coronavirus crisis (Gorenko & Juste, 2023) and now the 500 largest family firms in the world are seeing 10% increase in revenue from 2021, which means that top family firms are developing twice as fast compared to world's advanced economies (EY, 2023).

Lee (2006) in his research paper concluded that families indeed provide a beneficial impact on business. When other variables remain constant, family firms are inclined to experience faster growth and greater profitability, moreover no evidence was found that family firms would be less stable as a result of increased growth. The performance of family firms may be further enhanced if founding family members actively engage in management. Lee also points out that there are competitive disadvantages and challenges to being a family firm - balance between equity and efficiency, the succession problems and lastly, the dilemma that the head of family has to be altruistic to its family members as a relative but maximize efficiency of the firm and follow sound business practice as owner and manager. These dilemmas and challenges are harder to measure, and they might reduce the positive results in comparison between family and non-family firms.

While most researchers have established a positive correlation between being a family firm and achieving superior financial performance compared to other firms, there are some studies that present evidence to the contrary. The primary factor contributing to these different findings is the diversity within the sample and the specific characteristics of family firms, as not all of them share identical traits. Family

enterprises exhibit variations in their nature, such as the ownership share held by the family, and these specific aspects can either enhance or diminish their performance (Anderson & Reeb, 2003).

***Tangible: Financing***

Family enterprises are typically more risk-averse and carry lower levels of debt compared to non-family firms. However, Gonzalez et al. (2011) noted that the necessity of financing company growth, coupled with the risk of losing control of the firm, can force family businesses to take on greater levels of debt. Another research by Mandl (2008) presents that family businesses often have strong ties to the local community, leading to increased local business partnerships and collaboration. As a consequence, family firms approach downsizing or potential termination of the enterprise with greater caution compared to non-family firms. Financing decisions are important for family enterprises, because stakes for them are arguably higher as their business failure impacts the family itself - their budget and succession.

***Intangible: Relationships between family members***

The duality of roles of family members, encompassing responsibilities within both the firm and the family, can foster stronger bonds and enhance their commitment towards the business. If family members succeed in making this bond, it benefits them and the firm significantly - there will be less struggle for power in the company, pride and best use of each other's strengths, and lastly the family bond creates more understanding and sympathy for one's shortcomings (Tagiuri & Davis, 1996). Additionally, by having relatives in multiple roles in the company, the decision making becomes centralized and, therefore, more efficient. Regrettably, the practice of assigning multiple roles to relatives within a firm can sometimes be detrimental to both the business and the family. This issue often stems from the traditional differences in behavioural norms expected in family settings versus business environments. In families, values like harmony, conflict resolution, and maintaining peace among members are prioritized. In contrast, a business environment typically encourages a certain level of internal competition to enhance firm performance, which can clash with family values. These different norms in each environment can create confusion and one of the aspects may be sacrificed to preserve the other - competitiveness in the firm or unity of the family. What could be even worse is that family and business get mixed up, business decisions can turn into heated discussions about family issues or family decisions might be influenced by the disagreements at work. In result, businesses may

experience a deficiency in marketplace impartiality and inadequate profit management, while family members may sense that their well-being is compromised for the benefit of the family company. Lastly, as a result of these overlapping social systems, in conflict situations, family members can take on whatever role gives them more influence and power, which can severely damage relationships between relatives within the family (Tagiuri & Davis, 1996).

***Intangible: Future perspective and wealth preservation within the family***

Some argue that the primary motivator and distinguishing factor for family businesses, setting them apart from non-family enterprises, is the commitment not to sell the business. This mindset impacts all aspects of business activities, influencing core production processes, employee treatment, and community engagement. It is suggested that a significant portion of family business owners view themselves as temporary custodians with the responsibility to sustain and nurture the enterprise for the purpose of passing it on to the next generation. In contrast, non-family entrepreneurs aim to sustain the business throughout their lifetime and may opt to sell it at a certain point. Family businesses, exemplified by their emphasis on the long-term continuity of the enterprise rather than pursuing quick, short-term profits, prioritize the intention to extend the company's lifespan and transfer it during generational changes, which proves pivotal to their success. Such enterprises often operate more efficiently, benefitting from an experienced workforce, established networks of cooperation, and an existing customer base—attributes that are frequently lacking in newly established companies (Mandl, 2008).

***Intangible: Social Capital and Responsibility***

Family businesses not only prioritize their own interests but also give importance to their local communities. This commitment to community welfare is part of their Corporate Social Responsibility (CSR), which is crucial in maintaining a positive reputation. Leaders of these firms often see themselves as temporary guardians and feel a responsibility to engage in CSR activities. Such involvement is essential, as it forms the foundation for relationships with customers, employees, and potential investors. Research by (Chang, Zare & Ramadani, 2022) demonstrates that larger family businesses tend to invest more in CSR compared to non-family firms. In contrast, smaller family businesses often view CSR as an unaffordable expense, as noted by (Déniz & Suárez, 2005). Additionally, family firms are inclined to invest in product quality, linking it directly to their family name, according to (Turyakira, Venter

& Smith, 2014), similarly, the quality of reporting is also better compared to non-family counterparts due to attempts to make the family name seem better (Campopiano & De Massis, 2015).

#### ***2.4. ESG performance in family vs non-family firms***

Existing literature about family firm association with ESG yields different results. There is research that suggests that family firms are positively associated with ESG performance in the firms and exists research that states the opposite. The reasons for these different findings can be linked to the fact that there is no one universally accepted way of measuring ESG performance, therefore each research determines ESG score a little bit differently. In result, in literature review we included a larger scope of the ESG performance research in family vs non-family firms. Some papers in their analysis use ESG scores prepared by third party analytics (Méndez, Maquieira, and Arias (2023)), and some researchers develop ESG scores themselves by measuring how much ESG information the company is disclosing (Sharma, Kumar, and Kaur (2020)). There is also research that measures very similar things like Corporate and Social Performance (CSP). In our research paper, we have developed our own ESG score by measuring how much ESG related information the firm is disclosing.

Additionally, another reason for the fact that there are contradicting findings about family firm association with ESG could be that ESG scores and the nature of family firms differ in different parts of the world. Lastly, we have to bear in mind that in our research most of the companies are SMEs or smaller companies while a large part of the research on ESG performance in family firms has been done about companies listed on the stock exchange.

Research done in China by Sun, J. et al. (2023), where 1151 Chinese firms were analysed suggests that family ownership and family control positively affects firms ESG performance. Furthermore, the study reveals that market competition lessens the impact that family ownership and control have on the encouragement of adopting Environmental, Social, and Governance (ESG) criteria.

According to Ligard and Berdhanen (2022), who researched family firm ESG performance in 528 publicly traded corporations in the Nordic countries found that family-owned businesses tend to have lower ESG ratings compared to non-family-owned counterparts. Researchers explain these results are attributed to their underperformance in ESG initiatives that pose a potential threat to family control.

Specifically, these family firms are inclined to downgrade initiatives impacting internal stakeholders, such as managers, shareholders, and the workforce. Additionally, the research findings highlight that the ESG ratings of family firms are significantly influenced by the family's ability to shape the company's behavior, goals, and strategies. Notably, when a family member holds the position of CEO or when the family controls the board of directors, the ESG ratings tend to be even lower.

Canavati S. (2018) indicates that family-owned businesses generally have a positive effect on Corporate Social Performance (CSP). However, this effect varies between private and public family enterprises. Private family businesses have a beneficial impact on CSP, while public family-owned companies show a negative effect. This difference arises from how family involvement in the business—combining both ownership and management—relates to CSP, unlike situations where there is only family ownership or management. Private family businesses are more attentive to issues concerning the community, the environment, and employees compared to their public counterparts, which show lesser concern for these issues than both private and public companies without family ties. Moreover, the link between family businesses and CSP is stronger in places where regulations on labor and corporate governance are less strict.

The commitment of family firms towards community commitment extends to better Environmental, Social, and Governance (ESG) reporting, a trend highlighted in research by Sharma, Kumar, and Kaur (2020), as well as Sun, J. et al. (2023). This enhanced disclosure is notable, especially considering there is no significant direct financial benefit in doing so. In support of this, Méndez, Maquieira, and Arias (2023) found that the overall valuation of family firms does not differ significantly from their non-family counterparts, even if the ESG scores are higher. This finding leads to the hypothesis that family-owned businesses may be more inclined towards adopting sustainable business practices regardless. Those practices are not necessarily driven by financial returns but are likely aimed at preserving and growing their wealth sustainably over a more extended period, reflecting a long-term orientation and commitment to both the business and the broader community.

On the contrary, certain researchers, such as Memili E. et al. have identified family firms as being less responsible in their sustainability practices (2018). Cruz et al. study suggests that while family firms may be more responsive to external issues, they tend to be less responsive at managing internal conflicts (2014). This duality positions them as both better and worse than non-family owned firms in different aspects. Adding

to this complexity, Méndez, Maquieira & Arias (2023) assert that there is no clear consensus on whether family firms outperform in terms of ESG metrics. Furthermore, Rees & Rodionova (2015) observed a strong negative correlation between family ownership and ESG performance, highlighting the varied and often contradictory findings in this area of research.

Key factors commonly found in family firms, which could be associated with better ESG performance, include:

1. Long-Term Orientation: A focus on longevity and intergenerational transfer, leading to sustainable business practices.
2. Community Engagement: A strong connection to local communities, driving the implementation of CSR activities and enhancing social aspects of ESG.
3. Reputation Management: The linkage of business practices to the family name, promoting ethical conduct and responsible governance.
4. Employee Relations: A familial approach to employee treatment, potentially influencing the social dimension of ESG. Recent literature on the relationship between CSR and family ownership indicates that larger family businesses tend to invest more in CSR, implying a positive correlation with ESG performance.

However, the literature also presents contradictory findings. Studies like those by Memili E. et al. (2018) and Cruz et al. (2014) highlight the complexities in family firms' approach to sustainability and internal conflict management. Furthermore, there's no consensus on whether family firms consistently outperform non-family firms in ESG metrics. Given these mixed findings, a more structured review of the characteristics that distinguish family from non-family firms is needed. This review should delve into recent scholarly works and empirical studies that explore the nuances of how family ownership influences CSR and ESG practices. By doing so, the study aims to provide a clearer understanding of the relationship between family ownership and ESG performance, particularly addressing the gap in research on family-owned firms in the Baltics. Accordingly, our hypothesis would be that family ownership is positively associated with ESG performance of a firm. Accordingly, RQ: **Is family ownership positively associated with ESG performance of a firm?**

### 3. Methodology

#### 3.1 ESG

For our methodology we are going to adopt a methodology used by Sun J. et al (2023) which regresses the ESG score of the companies on a multitude of independent variables. (example picture below).

Figure 2 ESG score methodology

$$ESGscore = \beta_0 + \beta_1 * f_{ownership} + \beta_2 * assetturnover + \beta_3 * lev + \beta_4 * size + \beta_5 * age + \beta_6 * top1 + \beta_7 * ROA + \beta_7 * boardsize + \beta_8 * \Sigma Industry$$

Note. Adapted from "Family ownership and control as drivers for environmental, social, and governance in family firms," by J. Sun et al., 2023, *Review of Managerial Science*, Volume 18, pages 1015–1046

**Hypothesis: Family ownership is positively associated with the ESG performance of a firm.**

**Dependent variable:**

**ESG Disclosure Measurement:** due to the unavailability of ESG scores for our sample of companies, we will use an Index as a proxy for the ESG score, a method previously employed in research by Sharma, Kumar, and Kaur (2020).

The ESG reporting Index adopted in our methodology will be based on the framework established by Sharma, Kumar, and Kaur (2020), which in turn was derived from the disclosure categories outlined in the works of Haque & Deegan (2010) and Weinhofer & Hoffmann (2008). Example of Disclosure categories to look at is attached in **Appendix 1**.

Each category in the ESG reporting Index is rated on a scale from 0 to 3, based on the richness of information provided, as per the methodology outlined by Deegan & Haque (2010) and Weinhofer & Hoffmann (2008).

We will adopt the approach used by Sharma, Kumar and Kaur (2020):

- 0 if the item has not been disclosed;
- 1 if the item has been disclosed once.
- 2 if more than one times has been disclosed;

For regressions, the scores will be multiplied by 50 to normalize them to a 100 scale. After compiling the ESG score based on this methodology, we opted for a Logistic regression, as our data as unfit for OLS regressions due to non-normality and excess of 0 values as can be seen in **Table 9** and **Table 14** in appendix with most of the



sample having 0. That way an ESG binary variable was created with 0 still being 0 as and 1 and 2 scores from before were both assigned a 1. Meaning that 0 responds to no disclosure whatsoever and 1 to any type of ESG disclosure.

**Independent variable:**

1. Family ownership (*f\_ownership*)- binary variable where 1 is family controlled (ownership and management) and 0 is not. Data provided by the Baltic Family Firm Institute. The sample is constructed out of all companies in Latvia for 2022 and if data is unavailable then 2021. Afterwards it is filtered for at least 50% family-ownership defined as at least 50% of all company shares belonging to a people with same or similar last names (e.g. Ābols & Ābola).

**Control variables:**

Variables are related to the financial characteristics of a firm:

2. Asset Turnover (*assetturnover*): total asset turnover ratio calculated using the total revenue for that year divided by its total assets at the end of the year. Variables used from Orbis are OPRE and TOAS;
3. Leverage (*lev*): measured as the ratio between the totals of liabilities and assets. Variables used from Orbis are SHFD and TOAS;
4. Company size (*size*): measured by the natural logarithm of total assets in thousands of Euros +1 to not have negative values. Variables used from Orbis are TOAS;
5. Company Age (*age*): calculated using the focused year minus the year in which the firm was established, plus 1. Variables used from Orbis are INCORPORATION\_DATE, for missing values the data was sourced from Lursoft manually.
6. Return on Assets (*ROA*) calculated as Profit or loss for the year divided by total Assets for that year. Variables used from Orbis are PLBT and TOAS. Variables concerning corporate governance structures (we excluded characteristics not applicable to our sample):
7. Shareholding ratio of biggest shareholder (*top1*): calculated as the largest ownership quota divided by the total number of shares; Variable used from Orbis is SH\_DIRECT\_PCT
8. Board size (*boardnumber*): indicated by the overall number of active directors. Variable used from Orbis is CPYCONTACTS\_MEMBERSHIP\_DIFFERENT\_PERSONS\_CNT

The use of ORBIS website is summarized in **Table 12** available in the appendix.

**Fixed effect variables:**

Industry fixed effect (*industry*) according to NACE codes. **Appendix 2** shows the industries and their codes. In total there are 21 industries.

Data for ESG disclosure Index will be collected by authors through publicly provided information of companies on their websites with a web scrapper tool, more on it in section 3.3.

For a comparative analysis, the family vs non-family firms have been matched with a propensity score. Propensity score matching has effectively balanced the key variables between the treatment and control groups in this study as seen in **Table 8** and **Table 11** in the Appendix. The standardized mean differences (SMD) for covariates such as age, asset turnover, leverage, board size, and return on assets have considerably decreased after matching, indicating an improved balance and comparability between the groups. This allows for a more credible evaluation of the family ownership, ensuring that differences in the ESG score are more likely due to the family ownership itself rather than pre-existing differences between treated and untreated firms.

Data for Independent and Control variables will be taken from ORBIS and BFFI database on family firms.

### **3.2 Web-scrapper**

Our web scraper is a Python program designed to automatically collect data from specified company websites to assess their engagement with Environmental, Social, and Governance (ESG) issues. Here is a brief rundown of how it operated:

- 
- **Setup:** The script reads URLs from an Excel file and uses these to visit each company's website and one level of sub-pages. Websites were collected from ORBIS, variable name WEBSITE.
  - **Word Groups:** It looks for specific ESG-related terms on these web pages, such as "sustainability" or "emissions", more on our terms in the section 3.3.
  - **Data Extraction:** The script counts how often each ESG term appears on a page, giving an indication of the company's ESG focus.
  - **Final Results:** After processing all the URLs, a final Excel file is produced,

summarizing the ESG term frequency for each company's website.

After the results are obtained, we calculate the ESG disclosure index score based on our methodology outlined previously.

### 3.3 ESG vocabulary

To determine the firm's ESG disclosure score we developed an ESG and sustainability word dictionary. As we are doing our research about Latvian companies, more than 95% of the websites in our dataset are in Latvian, therefore we had to develop our dictionary in Latvian, which we did by finding appropriate words in English and then translating them to Latvian using Google Translate. To find the most appropriate words in the context, we examined various sources. The majority of our dictionary is built based on research done by Baier P. et al. (2018) where a textual analysis was done on environmental, social and governance reporting in annual reports. Additionally, a public glossary of corporate governance terms (Chartered Governance Institute), online vocabularies and online word association (<https://relatedwords.org/>) sites were used.

Some of the websites we put in web scraper were in English, therefore we also developed ESG and sustainability word dictionary in English based on the existing relevant Latvian word dictionary. Lastly, three sustainability reports from local companies - Schwenk, Latvenergo and Hansmatrix were examined, to help create a dictionary of Latvian ESG and sustainability related words. After reading relevant Latvian sustainability reports, word clouds were created to better summarize most appropriate ESG and sustainability keywords. After all analysis we created following vocabulary of ESG and sustainability words:

*Table 1 Latvian ESG word vocabulary. Created by the authors.*

|                           |   |
|---------------------------|---|
| Environmental performance | Bioloģiskā daudzveidība, bioloģisko daudzveidību, ietekme uz vidi, ietekmes uz vidi, vides aizsardzību, vides aizsardzība, vides aizsardzībai, CO <sub>2</sub> , emisiju, emisijas, izmešu, izmeši, siltumnīcefekts, siltumnīcefekta, klimats, klimatu, klimatriski, klimata, klimatrisks, piesārņojums, piesārņot, dabas aizsardzība |
| Social responsibility     | Darbinieks, darbinieku, darbinieki, darbiniekiem, pilsonis, pilsoņi, pilsoņa, invaliditāte, invalīds, apvienoto nāciju org,   |

|                       |  |
|-----------------------|--|
|                       | cilvēcība, diskriminācija, diskriminēt, virsstundas, virsstundu, etniskā, etniskais, emigrants, emigrācija, immigrants, imigrācija, lgbt, minoritāte, pandēmija, veselība, sabiedrība, sabiedrisks, bezdarbs, bezdarba, bezdarbnieks, csr, ziedo, labklājība, labdarība, bezpeļņas, apmācība, apmācīt  |
| Governance            | Gada pārskats, ilgtspējas pārskats, iekšējie noteikumi, nolikums, korupcija, pārvaldība, pārvaldīt, audits, auditēt, audita, auditors, auditori, pārraudzīt, pārrauga, pārskatīt, pārskatīšana, vadība, pilnvara, prēmija, kompensācija, kompensē, atlīdzība, alga, ievēlēt, ievēlēšana, priekšlikums, priekšlikumi, balsot, nobalsots, caurspīdīgums, integritāte, informācijas izpaušana, objektivitāte, prese, uzticības tālrunis, investors, investori, investīcijas |
| Sustainable practices | Ilgtspēja, ilgtspējīgs, ilgtspējas, ilgtspēju, atjaunīgs, atjaunīgais, atjaunīgie, atjaunīgajiem, atjaunojamais, atjaunojams, atjaunojamie, aprites ekonomika, atkalizmanto, pārstrāde, pārstrādāt, biogāzi, biogāze, biodegvielu, biodegviela, biometānu, biometāns, otrreizēja pārstrāde, taksonomija, reciklē, atkritumu šķirošana, saules paneļi, saules kolektori, elektroauto  |

Table 2 English ESG word vocabulary

|                           |  |
|---------------------------|--|
| Environmental performance | Biological diversity, environmental impact, impact on the environment, environmental protection, environment protection, co2, emission, emissions, thermal effect, greenhouse effect, climate risk, climate, pollute, pollution, nature protection   |
| Social responsibility     | Employee, citizen, disability, disabled person, united nations, humanity, discrimination, discriminate, overtime, ethnic, emigrant, emigration, immigrant, immigration, lgbt, minority, pandemic, health, society, social, unemployment, without a job, unemployed, csr, donate, welfare, charity, non-profit, training, teach |
| Governance                | Annual Report, board of directors, sustainability review, internal rules, regulation, corruption, management, manage, audit, auditor, supervise, supervisor, review, revision, management, compensation, compensates, salary, elect,   |

|                       |   |
|-----------------------|---|
|                       | election, proposal, proposals, vote, voted, transparency, integrity, disclosure of information, objectivity, hotline, investor, inventory, investments  |
| Sustainable practices | Sustainable, sustainability, renewable, circular economy, reused, processing, recycle, biogas, biofuel, biomethane, recycling, taxonomy, recycle, recycling, solar panels, solar collectors, electric car |

### **3.4. ESG and sustainability words: discussion**

#### ***Web pages in English***

Some Latvian company web pages are in English, therefore our web scraper was unable to detect the number of words connected to ESG and sustainability practices using Latvian word dictionary we developed. We cannot add English words to the Latvian vocabulary because some websites are available both in Latvian and in English, therefore web scraper would read and detect words in both languages, which would result in double counting that is not optimal. We solved this issue by running our web scraper using the English word dictionary on those company websites, which did not have any results from the initial web scraper run using Latvian word dictionary.

#### ***Word roots***

We considered putting only roots of the words from our ESG and sustainability vocabulary as it would increase the probability of finding all relevant words and giving more accurate scores, however, after some testing, we realized that due to the nature of the Latvian language, using word roots would greatly increase the “false positive” results meaning that web scraper would find more words which are not connected to ESG and sustainability. Many of the roots of our Latvian dictionary words were too short, therefore they were often a part of some other word that is not necessarily connected with ESG or sustainability. As you can see by examining our dictionary, in the end, we decided against using word roots in our dictionaries.

#### ***False positives***

As it is almost impossible to find words that are used only in the ESG or sustainability context, there are definitely some “False positive” hits from our web scraper. We greatly reduced the risk of many “false positive” hits by developing a dictionary using words in their full length and declension of the word. We examined the

results and manually took out “false positives” we identified. Great example for false positives results was a company, which sells engines and exhausts. In their website, Latvian word “izmeši”, which means emissions, was mentioned more than 1000 times, which is a clear false positive result.

### **3.5. Descriptive statistics**

The descriptive statistics from the full sample **Table 6** in the appendix compared to the final ESG-scored sample **Table 10** indicate a few noteworthy changes that could influence the results of the analysis. Full and final sample refers to the sample extracted from Orbis versus the final sample for which only companies with possible ESG disclosure score are left. More on this in **Limitations** part.

**Asset Range Change:** The decrease in the mean and median values of size variable within the final ESG-scored sample suggests a smaller set of companies in terms of size. This means that our final sample is skewed to the smaller side of the companies and results could not be fully extended to the whole population.

**Age Consistency:** The consistency in median age between the full and the final samples implies that company age might have a similar influence in both datasets. Thus, the effect of age on ESG scores could potentially be used to explain the broader population.

**Board Size Uniformity:** With no significant change in board size from the full to the final sample, it's likely that any findings related to board size and ESG scores are representative of the larger population.

**Winsorized Variables:** The use of winsorized variables for leverage, asset turnover, and return on assets controls for extreme values that could distort the regression results with 3/97 winsorisation. In the final ESG-scored sample, these adjustments ensure that the findings are driven by the central tendency of the data rather than outliers, leading to more robust conclusions about how these factors are associated with ESG performance.

### **3.6. Industry differences**

The comparison of industry distribution between the full sample and the final ESG-scored sample seen in **Table 7** in the appendix shows a variation in the number of companies across different sectors. Key observations include:

1. **Manufacturing Dominance:** There is a substantial presence of manufacturing firms in both samples, but their proportion has increased in the final ESG-scored sample. This suggests that manufacturing companies are more likely to report ESG scores, which could be due to higher regulatory or public pressure in this sector.
2. **Retail and Wholesale Shift:** While still significant, the wholesale and retail trade sector show a decrease in its representation, possibly due to the nature of B2B businesses. This reduction could influence the ESG score results since this sector might have specific ESG challenges and practices.
3. **Consistent Representations:** Some industries like 'Agriculture, Forestry and Fishing' and 'Transportation and Storage' have maintained a consistent presence, indicating that any sector-specific findings are likely representative of these industries.
4. **Decreased Diversity in Smaller Sectors:** Smaller sectors like 'Mining and Quarrying' and 'Electricity, Gas, Steam and Air Conditioning Supply' have seen a reduction in their counts, which may limit the generalizability of the results to these specific industries.
5. **Potential Bias:** The difference in counts of full and final sample could introduce a selection bias, where certain industries are over or underrepresented in the final ESG-scored sample compared to the full sample. This is important to consider when generalizing findings to the entire population.

The adjusted ESG-scored sample shows a shift in industry representation, with more manufacturing firms and fewer from other sectors, which could tilt the analysis towards the ESG trends of these industries. Therefore, results should be interpreted with caution, recognizing the need for industry-specific analysis. The aim of these adjustments is to reduce the effect of outliers for a clearer picture of the average firm's ESG profile and to ensure more trustworthy conclusions about the relationship between corporate attributes and ESG scores. However, this method might overlook the impact of exceptional cases, emphasizing the importance of considering how the sample's makeup and extreme values might influence the ESG performance insights drawn from the data.

#### 4. Limitations

To use our web scraper, we had to find web pages for companies in our dataset. We did this by uploading our company dataset to ORBIS, where we could add web pages of those companies who had them. Overall, around 70% of companies in our dataset had websites, companies which did not have websites were mostly older or business to business type of companies.

Additional issue that limited our research was the fact that company websites are created and work in different ways. Some websites load entire content when you click on the link (HTML), however some websites load the content only as you continuously scroll through or click to hyperlinks (Javascript), which means that the code to get data would have to be significantly harder and require significantly more computing power. In the end, around 68% of the companies from the original dataset had websites, which could be analysed by our web scraper.

*Table 3 Company sample sizes*

|                  | Total company count | After using web scraper | After propensity matching |
|------------------|---------------------|-------------------------|---------------------------|
| Family Firms     | 2197                | 1458                    | 1458                      |
| Non-family firms | 3131                | 2200                    | 1458                      |
| Total            | 5328                | 3658                    | 2916                      |

As already mentioned, some of the websites we put in web scraper were in English, therefore our web scraper incorrectly counted 0 words related to ESG, that issue was addressed by running the web scraper in English words again. To avoid double counting, the script for English words will only run for companies, who had 0 words in total.

The biggest limitation is the fact that the sample that we made analysis on could be biased due to omitted companies. An example could be that in the second stage of eliminations, where our web scraper for various reasons is unavailable to access the information, and therefore can't score it. The bias could be that websites that we can't



access have a significant outcome on the results and greatly differ from sample available to us.

*Table 4 Logit model for ESG disclosure score. Dependent variable: ESG Disclosure score dummy*

## 5. Results

| Variable              | Score                       |
|-----------------------|-----------------------------|
| Family_dum            | -0.133<br>(0.094)           |
| age                   | 0.061***<br>(0.005)         |
| assetturnover_wins    | 0.084***<br>(0.022)         |
| lev_wins              | 0.380**<br>(0.166)          |
| size                  | 0.497***<br>(0.047)         |
| boardsize             | 0.128**<br>(0.059)          |
| top1                  | 0.001<br>(0.002)            |
| Industry fixed effect | Yes                         |
| Observations          | 2,916                       |
| Note:                 | *p<0.1; **p<0.05; ***p<0.01 |

Note: This table presents the results from a logistic regression model predicting ESG disclosure score. Coefficients with asterisks denote levels of statistical significance, with standard errors in parentheses. The dependent variable is the ESG Disclosure score.

The logistic regression model exploring the determinants of ESG performance highlights several significant insights. Notably, family ownership was not statistically significant in predicting positive ESG scores, suggesting its impact is potentially subtle or overshadowed by other factors. In contrast, company age was strongly positive, indicating that older firms are more likely to exhibit strong ESG practices, perhaps due to more developed governance structures and a history of adapting to regulatory and social expectations.

Operational efficiency, as measured by asset was a positively correlated with ESG performance, hinting that firms that utilize their assets more effectively also engage more in ESG activities. Similarly, leverage had a positive association, suggesting that companies with higher levels of debt might be incentivized to improve ESG performance to appeal to risk-aware creditors.

Larger companies were found to have a higher likelihood of better ESG scores, which could be attributed to their capacity to invest in sustainability and to more intense public scrutiny. A larger board size also positively correlated with ESG scores, possibly due to a more diverse range of perspectives and expertise guiding the company towards responsible practices.

The concentration of ownership by the largest shareholder did not significantly affect ESG scores, indicating that the presence of a dominant shareholder alone does not drive ESG performance. In **Table 13** the Variance Inflation Factor (VIF) test results for your model indicate that multicollinearity is not a concern for most of your variables, as their VIF scores are well below the common threshold of 5 or 10. Overall, these VIF results suggest that the independent variables in your logit model provide robust results when analyzing our dependant variable.

The industry played a substantial role, with several industries showing a significant positive association with ESG scores, underscoring the fact that industry-specific dynamics can greatly influence ESG outcomes. As industries play a big role in ESG disclosure index based on our findings we analysed all of the industries with at least 100 observations in the final sample separately.

*Table 5 Logit by industry (at least 100 observations)*

| Predictor          | Agriculture | Manufacturing | Construction | Retail   | Transport | Info. and comm. | Real estate | Prof. and scientific activities | Admin. and Service Activities |
|--------------------|-------------|---------------|--------------|----------|-----------|-----------------|-------------|---------------------------------|-------------------------------|
| Intercept          | -11.39***   | -8.30***      | -9.18***     | -6.90*** | -10.99*** | -10.15***       | -6.11**     | -7.79**                         | -4.82                         |
| Family_dum         | 0.35        | 0.01          | 0.36         | -0.13    | -0.56     | 0.01            | -0.18       | -0.96                           | -1.13*                        |
| Age                | 0.01        | 0.04**        | 0.04*        | 0.06***  | 0.09***   | 0.04            | 0.10***     | 0.08*                           | 0.07**                        |
| Asset Turnover     | 0.49**      | 0.07          | 0.17         | 0.07*    | 0.15*     | 0.16            | 0.05        | 0.08                            | 0.04                          |
| Wins               |             |               |              |          |           |                 |             |                                 |                               |
| Lev Wins           | 0.94        | 0.37          | -0.09        | 0.2      | 0.63      | 1.01            | 1.09        | -0.49                           | 0.96                          |
| Size               | 0.94***     | 0.72***       | 0.67***      | 0.54***  | 0.55***   | 1.09***         | 0.29        | 0.50*                           | 0.06                          |
| Board Size         | 0.01        | -0.27*        | 0.48         | 0.15     | 0.78**    | 0.19            | 0.27        | 0.44                            | 0.27                          |
| Top1               | -0.01       | 0             | 0.01         | 0        | 0.02**    | -0.02*          | 0           | 0.01                            | 0.03*                         |
| Observations       | 228         | 394           | 247          | 1057     | 340       | 111             | 133         | 107                             | 103                           |
| Model Significance | p<0.001     | p<0.001       | p<0.001      | p<0.001  | p<0.001   | p<0.001         | p<0.01      | p<0.05                          | p<0.1                         |

Note: The table represents logistic regression models by industry categories with at least 100 observations. The models estimate the effect of various predictors on a dependent variable. Statistical significance is denoted as follows: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001. The number of observations for each industry model varies, and can be seen in *Table 7* in the Appendix.

In our analysis, several industry sectors revealed notable trends that reflect on their interaction with ESG criteria. For Agriculture, Forestry, and Fishing (NACE Code A), no significant predictors for ESG practices were found, suggesting these sectors' ESG activities may not align directly with the variables we examined. Manufacturing (NACE Code C) and Construction (NACE Code F) showed that larger entities are more

inclined towards ESG, likely due to their greater capacity and environmental impact, emphasizing the role of company size and operational efficiency.

Wholesale and Retail Trade (NACE Code G) indicated nuanced effects of family ownership on ESG, pointing to the complex dynamics within these businesses. The Transportation and Storage (NACE Code H) and Information and Communication (NACE Code J) sectors underlined the critical impact of governance in guiding ESG efforts, highlighting the importance of robust governance for industries dependent on infrastructure and technology.

Conversely, the Professional, Scientific, and Technical Activities (NACE Code M) and Administrative and Support Service Activities (NACE Code N) sectors observed a negative relationship between family ownership and ESG, suggesting challenges for family businesses in these fields to align with ESG standards. These insights highlight the necessity for industry-specific ESG strategies, reflecting each sector's unique operational and environmental characteristics.

## **6. Discussion**

In our study, we delved into how family ownership influences a company's ESG performance, with a special focus on different industries. This has led us to insights that both align with and challenge the existing research on the topic.

Previous studies, like those by Anderson and Reeb (2003), suggested family firms often perform better, hinting they might also excel in ESG practices. However, our findings reveal a more complex picture. Unlike Turyakira, Venter & Smith (2014), who believed family firms are naturally inclined to protect their socioemotional wealth by adopting better environmental practices, our analysis shows that family ownership doesn't always lead to superior ESG performance. This suggests we need to look deeper into family firms' diverse characteristics and how industry specifics might alter their approach to ESG.

The influence of industry characteristics on ESG practices, highlighted in our study, highlights the need for a more in-depth understanding of ESG practices within specific sectors. This aligns with the arguments by Canavati S. (2018), about the varying institutional demands for CSR disclosure across industries. Our findings support the notion that both family and non-family firms respond differently to these demands, depending on their industry.

Moreover, our study expands on the ideas presented by Sharma, Kumar, and Kaur (2020) regarding the resource-based capabilities of larger firms in engaging with ESG practices. It seems that in sectors like manufacturing and construction, the size of a company plays a significant role in its ESG engagement, suggesting that larger firms may have more resources and motivation to invest in sustainable practices.

Latvian firms, being part of transition market often face distinct challenges that include limited access to resources, a less developed corporate governance landscape, and evolving environmental and social norms. These factors can hinder the adoption of comprehensive ESG practices and may explain why family ownership does not always translate into superior ESG performance in this context. The findings highlight the importance of considering the developmental stage of the market when assessing the efficiency and motivations behind ESG practices in different regions. This aspect underscores the need for targeted strategies that not only promote ESG awareness and adoption among family-owned firms in Latvia but also address the systemic barriers inherent in a transition market context, a promising avenue for future research is to formulate a hypothesis that explores the comparative ESG performance of family-owned businesses within the broader Baltic region.

Practical implications of our study are:

**1. For Family-Owned Businesses:**

- Family-owned firms should recognize the varied nature of ESG performance and consider how their unique governance structures can be leveraged to enhance sustainability practices. Tailored ESG strategies that align with the company's values and long-term vision can be developed to harness the benefits of strong family ties and commitment to legacy.
- Given the significant role of industry in determining ESG outcomes, family businesses in sectors with pronounced environmental impacts, such as manufacturing and construction, should prioritize investment in green technologies and sustainable practices. This not only mitigates environmental risk but can also enhance brand reputation and competitive advantage.

**2. For Policymakers and Regulatory Bodies:**

- The findings underscore the need for policies that support and incentivize ESG integration across different industries. Sector-specific

guidelines and frameworks can be developed to address unique challenges and opportunities, encouraging firms to adopt best practices in sustainability.

- Policymakers should consider creating supportive ecosystems that facilitate knowledge sharing and collaboration among family-owned businesses. This could include workshops, forums, and online platforms where companies can exchange insights on effective ESG strategies and learn from industry leaders.

By integrating insights from previous research into our findings, we aim to build on the existing knowledge while offering new perspectives on the relationship between family ownership, industry characteristics, and ESG performance. This approach not only acknowledges the foundation laid by past scholars but also highlights the unique contributions of our study, inviting further research to explore the intricacies revealed by our analysis

## **7. Conclusions**

The purpose of this research was to analyze the interplay between family ownership and the Environmental, Social, and Governance (ESG) performance of firms, particularly within the context of Latvia's evolving market landscape. This exploration was aimed at answering the central research question: "Is family ownership positively associated with ESG performance of firms in Latvia?" Through a comprehensive analysis incorporating a variety of control variables and industry effects, this study offers different insights into the dynamics that underpin ESG practices in family-owned businesses versus their non-family counterparts.

The findings of this research suggest that while family ownership is not clearly associated with ESG performance in Latvia, the relationship is varied and significantly shaped by factors such as company size, asset turnover, and the specific industry in which a firm operates. Notably, industry emerged as a potent predictor of ESG outcomes, underscoring the critical role that sector-specific characteristics and challenges play in shaping a firm's ESG agenda.

This research underscores the significance of considering both the micro-level dynamics of family ownership and broader industry trends when evaluating ESG performance. The understanding gained from this study highlights the complexity of

ESG implementation in Latvia's transitional economy, where varying degrees of market development and regulatory frameworks can impact ESG practices. Such insights not only contribute to the academic discourse on ESG and family businesses but also offer practical implications for policymakers and corporate strategists aiming to strengthen sustainable development within the Baltic region.

Looking forward, this study paves the way for further research into the comparative analysis of ESG practices across the Baltic states, to dissect how regional disparities in economic development and governance influence ESG outcomes. The insights from such inquiries could be instrumental in designing tailored strategies that foster the integration of sustainable practices in family-owned businesses, ultimately contributing to the broader goals of environmental stewardship, social responsibility, and governance excellence.

The adoption of web scraping tools for data collection in this research marks a methodological advancement in ESG studies. This novel approach not only refines the accuracy of our findings but also offers a blueprint for future research, potentially transforming ESG data analysis. The method's ability to efficiently harness online information promises to enrich the academic dialogue on ESG practices and provide actionable insights for stakeholders.

In conclusion, the exploration into the relationship between family ownership and ESG performance within the Latvian context has illustrated factors that influence sustainable business practices. By addressing the posed research question, this study not only sheds light on the specific challenges and opportunities faced by family-owned firms in Latvia but also invites a broader examination of how such dynamics manifest in similar transition markets. The implications of this research can extend beyond academic interest by offering a base foundation upon which businesses and policymakers can build more resilient, sustainable, and socially responsible corporate strategies.

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3Npb24sIEF1c3RyaWFuCkluc3RpdHV0ZSBmb3IgU01FIFJlc2VhcmNoLkiW  
DVCYB1iYB3ACeAGQAQCYAQCgAQCqAQC4AQPIAQD4AQH4AQKoAg  
DiAwQYACBBiAYB&sclient=gws-wiz-serp (1st link)

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## Appendices

*Appendix 1 Summary of the Measures of Variables. Created by authors, based on Sharma, Kumar, and Kaur (2020).*

| Category                             | Items  |
|--------------------------------------|--|
| <b>I. Social Performance</b>         | 1. Promotion of education through donations, scholarships  |
|                                      | 2. Sponsorship of public health projects/medical camps   |
|                                      | 3. Establishment/maintenance of educational institutions   |
|                                      | 4. Supporting the development of local industries or community programs and activities           |
|                                      | 5. Participation in social government schemes and campaigns                                      |
| <b>II. Environmental Performance</b> | 1. Environmental awards Received   |
|                                      | 2. Environmental programs Response to environmental audits                                       |
|                                      | 3. Environmental Awareness Training  |
|                                      | 4. Presence of Environmental Management System (EMS)   |
|                                      | 5. Amount spent on environmental protection  |
| <b>III. Sustainable Practices</b>    | 1. Prevention, reduction and fixing of air/water/soil emissions                                  |
|                                      | 2. Recycling of waste material   |
|                                      | 3. Energy consumption and measures to improve energy efficiency-use of renewable energy          |
|                                      | 4. Consumption of raw materials and measures taken to improve the efficiency of raw material use |
|                                      | 5. Measures to reduce greenhouse gas emissions   |
| <b>IV. Governance</b>                | 1. Board size  |
|                                      | 2. Board Independence  |
|                                      | 3. Board Meetings  |
|                                      | 4. CEO-Duality   |
|                                      | 5. Multiple Directorships  |

*Appendix 2 Classification of NACE codes*

| Code | Economic Area  |
|------|--|
| A    | Agriculture, Forestry and Fishing                                    |
| B    | Mining and Quarrying   |
| C    | Manufacturing  |
| D    | Electricity, Gas, Steam and Air Conditioning Supply                  |
| E    | Water Supply; Sewerage, Waste Management and Remediation Activities  |
| F    | Construction   |
| G    | Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles |
| H    | Transportation and Storage   |

|   |   |
|---|---|
| I | Accommodation and Food Service Activities   |
| J | Information and Communication   |
| K | Financial and Insurance Activities  |
| L | Real Estate Activities  |
| M | Professional, Scientific and Technical Activities   |
| N | Administrative and Support Service Activities   |
| O | Public Administration and Defence; Compulsory Social Security   |
| P | Education   |
| Q | Human Health and Social Work Activities   |
| R | Arts, Entertainment and Recreation  |
| S | Other Service Activities  |
| T | Activities of Households as Employers; Undifferentiated Goods and Services Producing Activities of Households for Own Use |
| U | Activities of Extraterritorial Organisations and Bodies   |

Table 6 Descriptive statistics of variables for the full sample. Created by authors.

| Statistic     | N    | Minimum | 1st_Quartile | Median  | Mean    | 3rd_Quartile | Maximum    | 1%     | 5%     | 95%      | 99%       |
|---------------|------|---------|--------------|---------|---------|--------------|------------|--------|--------|----------|-----------|
| Assets        | 5328 | 0.60    | 992.36       | 2167.10 | 8722.39 | 5802.53      | 1276496.69 | 122.91 | 328.34 | 28601.00 | 110892.06 |
| size          | 5328 | -0.50   | 6.90         | 7.68    | 7.81    | 8.67         | 14.06      | 4.81   | 5.79   | 10.26    | 11.62     |
| age           | 5328 | 0.00    | 9.00         | 16.00   | 16.60   | 25.00        | 31.00      | 1.00   | 3.00   | 30.00    | 31.00     |
| boardsize     | 5328 | 0.00    | 1.00         | 2.00    | 1.98    | 2.00         | 25.00      | 1.00   | 1.00   | 4.00     | 7.00      |
| lev           | 5328 | 0.00    | 0.28         | 0.49    | 0.76    | 0.71         | 585.23     | 0.02   | 0.08   | 1.05     | 2.51      |
| assetturnover | 5328 | 0.00    | 1.22         | 2.15    | 3.78    | 3.59         | 1772.01    | 0.07   | 0.28   | 8.92     | 20.04     |
| ROA           | 5328 | -187.37 | 0.02         | 0.11    | 0.41    | 0.23         | 1770.80    | -0.96  | -0.17  | 0.55     | 0.97      |
| top1          | 5328 | 0.68    | 60.00        | 100.00  | 84.04   | 100.00       | 100.00     | 25.00  | 39.52  | 100.00   | 100.00    |

Note: **Assets**: Total assets at year-end. **Size**: Logarithm of total assets, reflecting company size. **Age**: Time since company incorporation. **Board Size**: Number of directors on the board. **Lev**: Financial leverage, calculated as total debt divided by total assets. **Asset Turnover**: Revenue generated per unit of assets. **ROA**: Return on assets, indicating the company's profitability relative to its total assets. **Top 1**: Percentage ownership by the largest shareholder. This table reports the descriptive statistics for financial indicators used in the analysis, with N indicating the number of observations. The 1st and 3rd quartiles, and the 1%, 5%, 95%, and 99% columns, represent the respective percentile ranks in the distribution of each variable.

Table 7 Firms from each industry in the initial sample and after using web scraper. Created by authors.

| Industry  | Count before | Count after |
|---|--------------|-------------|
| Agriculture, Forestry and Fishing                                   | 349          | 273         |
| Mining and Quarrying  | 33           | 17          |
| Manufacturing   | 809          | 534         |
| Electricity, Gas, Steam and Air Conditioning Supply                 | 74           | 51          |
| Water Supply; Sewerage, Waste Management and Remediation Activities | 52           | 38          |
| Construction  | 472          | 290         |

|  |      |      |
|--|------|------|
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | 1808 | 1255 |
| Transportation and Storage   | 617  | 405  |
| Accommodation and Food Service Activities                            | 76   | 47   |
| Information and Communication  | 218  | 161  |
| Real Estate Activities   | 260  | 198  |
| Professional, Scientific and Technical Activities                    | 197  | 141  |
| Administrative and Support Service Activities                        | 188  | 134  |
| Public Administration and Defence; Compulsory Social Security        | 4    | 3    |
| Education  | 17   | 13   |
| Human Health and Social Work Activities                              | 88   | 55   |
| Arts, Entertainment and Recreation                                   | 52   | 35   |
| Other Service Activities   | 14   | 8    |
| Total  | 5328 | 3658 |

*Table 8 Balance measures before and after propensity matching*

| Covariate           | Type       | Difference<br>Unadjusted | Difference<br>Adjusted |
|---------------------|------------|--------------------------|------------------------|
| Distance            | Distance   | 0.887                    | 0.268                  |
| Age                 | Continuous | -0.018                   | -0.028                 |
| Asset Turnover Wins | Continuous | 0.276                    | 0.168                  |
| Lev Wins            | Continuous | -0.272                   | -0.102                 |
| Board Size          | Continuous | -0.894                   | -0.124                 |
| ROA Wins            | Continuous | 0.286                    | 0.174                  |

Note: This table reports the standardized mean differences (SMD) for each covariate before and after propensity score matching. A lower SMD after matching indicates better balance between the treatment and control groups on the covariate.

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*Table 9 Descriptive statistics of ESG score. Created by authors.*

| Min. | 1st Qu. | Median | Mean  | 3rd Qu. | Max. |
|------|---------|--------|-------|---------|------|
| 0    | 0       | 0      | 15.62 | 25      | 100  |

Note: This table presents the range and central tendency measures for the ESG (Environmental, Social, and Governance) score used in the analysis based on data from the web scraper developed by the authors. The ESG score ranges from 0 to 100, with a mean score of 15.62. The table is created by the authors.



Table 10 Descriptive statistics of variables. Created by authors.

| Statistic      | N    | Minimum | 1st_Quart. | Median  | Mean    | 3rd_Quartile | Maximum    | 1%     | 3%     | 5%     | 95%      | 97%      | 99%       |
|----------------|------|---------|------------|---------|---------|--------------|------------|--------|--------|--------|----------|----------|-----------|
| Assets         | 2916 | 0.60    | 1021.95    | 2229.14 | 9684.65 | 6087.11      | 1276496.69 | 116.20 | 239.31 | 320.16 | 30344.96 | 51113.72 | 123191.14 |
| size           | 2916 | -0.50   | 6.93       | 7.71    | 7.85    | 8.71         | 14.06      | 4.76   | 5.48   | 5.77   | 10.32    | 10.84    | 11.72     |
| age            | 2916 | 0.00    | 9.00       | 15.00   | 16.18   | 24.00        | 31.00      | 1.00   | 2.00   | 3.00   | 30.00    | 31.00    | 31.00     |
| boardsize      | 2916 | 0.00    | 1.00       | 2.00    | 1.98    | 2.00         | 25.00      | 1.00   | 1.00   | 1.00   | 4.00     | 5.00     | 7.00      |
| lev            | 2916 | 0.00    | 0.28       | 0.49    | 0.83    | 0.70         | 585.23     | 0.02   | 0.05   | 0.08   | 1.05     | 1.27     | 2.39      |
| assetturnover  | 2916 | 0.00    | 1.22       | 2.15    | 4.07    | 3.62         | 1772.01    | 0.07   | 0.15   | 0.28   | 9.03     | 11.94    | 21.24     |
| ROA            | 2916 | -77.20  | 0.03       | 0.11    | 0.58    | 0.24         | 1770.80    | -0.84  | -0.29  | -0.16  | 0.57     | 0.71     | 0.99      |
| top1           | 2916 | 3.32    | 64.82      | 100.00  | 84.62   | 100.00       | 100.00     | 25.00  | 33.33  | 39.96  | 100.00   | 100.00   | 100.00    |
| ROA wins.      | 2916 | -0.29   | 0.03       | 0.11    | 0.15    | 0.24         | 0.71       | -0.29  | -0.29  | -0.16  | 0.57     | 0.71     | 0.71      |
| lev wins.      | 2916 | 0.05    | 0.28       | 0.49    | 0.51    | 0.70         | 1.27       | 0.05   | 0.05   | 0.08   | 1.05     | 1.27     | 1.27      |
| assettrn wins. | 2916 | 0.15    | 1.22       | 2.15    | 2.92    | 3.62         | 11.94      | 0.15   | 0.15   | 0.28   | 9.03     | 11.88    | 11.94     |

Note: The table reports descriptive statistics for key financial and performance variables. "Min" and "Max" indicate the minimum and maximum values observed; "1st Quart." and "3rd Quart." refer to the first and third quartiles, respectively. The percentile columns provide additional distribution insights at various thresholds for each variable.

Table 11 Before and after propensity matching. Created by the authors.

| Variable       | Before/After | t Value | Degrees of Freedom | p-Value   | 95% Confidence Interval | Mean in Group 0 | Mean in Group 1 |
|----------------|--------------|---------|--------------------|-----------|-------------------------|-----------------|-----------------|
| Age            | Before       | 0.53    | 3149.5             | 0.596     | -0.4295 to 0.7481       | 16.280          | 16.121          |
| Age            | After        | 0.76    | 2913.7             | 0.447     | -0.3952 to 0.8959       | 16.371          | 16.121          |
| Asset Turnover | Before       | -8.56   | 2838.5             | < 2.2e-16 | -0.9611 to -0.6030      | 2.608           | 3.391           |
| Asset Turnover | After        | -4.58   | 2912.2             | 4.76E-06  | -0.6789 to -0.2721      | 2.915           | 3.391           |
| Lev Wins       | Before       | 7.70    | 3336.2             | 1.84E-14  | 0.0557 to 0.0938        | 0.536           | 0.461           |
| Lev Wins       | After        | 2.68    | 2903.4             | 0.007411  | 0.0076 to 0.0488        | 0.490           | 0.461           |
| Board Size     | Before       | 19.01   | 3540.9             | < 2.2e-16 | 0.6991 to 0.8599        | 2.286           | 1.507           |
| Board Size     | After        | 3.14    | 2877.1             | 0.001712  | 0.0404 to 0.1749        | 1.615           | 1.507           |
| ROA Wins       | Before       | -8.76   | 2933.7             | < 2.2e-16 | -0.0736 to -0.0467      | 0.125           | 0.185           |
| ROA Wins       | After        | -4.78   | 2909.8             | 1.80E-06  | -0.0515 to -0.0216      | 0.148           | 0.185           |
| Size           | Before       | 18.49   | 3564.6             | < 2.2e-16 | 0.7426 to 0.9187        | 9.183           | 8.352           |
| Size           | After        | 11.44   | 2825.9             | < 2.2e-16 | 0.4585 to 0.6480        | 8.905           | 8.352           |

Note: This table displays t-test statistics for key variables before and after propensity score matching, with significance levels and confidence intervals provided for comparison purposes. The mean values in groups 0 and 1 represent the mean of the variables for the control and treatment groups, respectively, before and after matching.

Table 12 Variables and data sources from ORBIS website

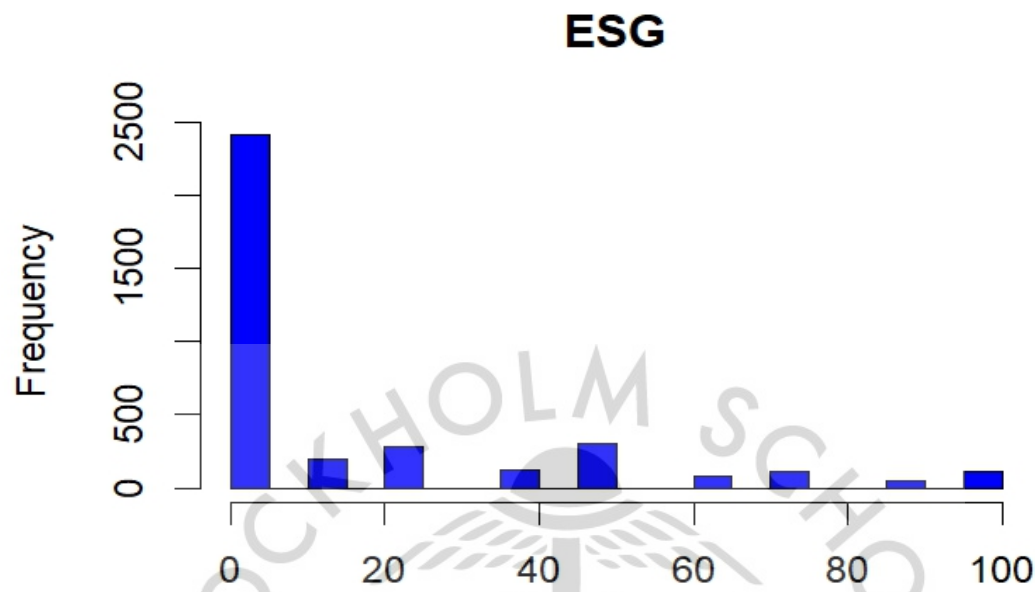
| Variable   | Data Source   |
|--|---|
| Family Ownership (f_ownership)                   | Anete Pajuste and Baltic Family Firms Institute                                     |
| Asset Turnover (assetturnover)                   | Orbis (OPRE and TOAS variables)   |
| Leverage (lev)                                   | Orbis (SHFD and TOAS variables)   |
| Company Size (size)                              | Orbis (TOAS variable)   |
| Company Age (age)                                | Orbis (INCORPORATION_DATE variable) and Lursoft for missing values                  |
| Return on Assets (ROA)                           | Orbis (PLBT and TOAS variables)   |
| Shareholding Ratio of Biggest Shareholder (top1) | Orbis (SH_DIRECT_PCT variable)  |
| Board Size (boardnumber)                         | Orbis (CPYCONTACTS_MEMBERSHIP_DIFFERENT_PERSONS_CNT variable)                       |
| Industry Fixed Effect (industry)                 | Web scraper tool for publicly provided company information and Orbis for NACE codes |

Table 13 Variance Inflation Factors for Logit Model Predictors

| Predictor          | VIF      | Degrees of Freedom | $GVIF^{1/(2*DF)}$ |
|--------------------|----------|--------------------|-------------------|
| Family_dum         | 1.119301 | 1                  | 1.05797           |
| Age                | 1.153986 | 1                  | 1.074237          |
| Assetturnover_wins | 1.700726 | 1                  | 1.304119          |
| Lev_wins           | 1.103855 | 1                  | 1.050645          |
| Size               | 1.687458 | 1                  | 1.299022          |
| Board Size         | 1.143072 | 1                  | 1.069146          |
| Top1               | 1.120382 | 1                  | 1.058481          |
| Industry           | 1.373759 | 17                 | 1.009383          |

Note: This table reports the Variance Inflation Factors (VIF) for each predictor in the logistic regression model (logit\_model). VIF assesses the level of multicollinearity in the regression predictors, with values above 5 or 10 typically indicating high multicollinearity. GVIF is the generalized VIF. The degrees of freedom (DF) associated with each predictor are also provided. For categorical predictors with multiple levels (e.g., Industry), the VIF is adjusted for the degrees of freedom.

Table 14 ESG score distribution in sample constructed by the authors



Note: This table describes ESG score distribution between firms.