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Predictors of profitability of the Estonian family-owned firms

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I hereby declare that I have compiled the thesis independently
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TABLE OF CONTENTS

ABSTRACT

The aim of the research was to determine factors driving profitability of Estonian family-owned firms. The methodology used was to identify and collect appropriate data, prepare statistical calculations, run regression analysis on the indexes of profitability, analyse the results and compare them to the findings of previous research.
The highlighted result of the study is the finding that debt leverage and management are only partial predictors of profitability. They cannot be used on their own to fully explain changes in profitability indexes. It was also showed that tangible assets ratio is a partial positive predictor of profitability, while increase in assets turnover is its significant, negative predictor.

Keywords: SME, family business, profitability, predictors, debt leverage, debt management, tangible assets ratio, assets turnover.

INTRODUCTION

According to the European Commission, family businesses constitute a substantial part of existing European companies, and have a significant role to play in the strength and dynamism of the European economy. Family businesses cover a wide spectrum of firms across different sectors and of different sizes, ranging from sole proprietors to large multinational enterprises. At the same time, the effects of family ownership of businesses on European economies are still not fully quantified to track any changes over time and estimate their overall impact. At the moment, there is insufficient data concerning the role and economic importance of family businesses in Europe. Previous studies suggest that in the year 2007 almost 90 % of all registered businesses in Estonia were under category of family business. With Estonian strong entrepreneurial spirit, these businesses likely have a role of paramount importance in the economy. This figure was much larger for Estonia in comparison with other countries of the European Union, and indicated a higher prevalence of family-owned businesses in Estonia, where family businesses only make up 40–60 % of the economy. Thus, it is crucial to understand what contributes to success of these businesses. This information may be important to many types of people at once, like: lawmakers, investors, business owners themselves and workers. Most studies done on the subject have evaluated the mood, view on the future, introduction of non-family workers and intra-generational conflict using surveys. But most of the studies did not consider the metrics of efficiency or profitability or any quantitative measurements of such establishments in specific countries.

Family business structure has been described as arguably having its inherent advantages and disadvantages. Various economic theories and research suggest that businesses could be affected in several ways by the family business structure. Some processes can be facilitated and ensuing advantages accumulated over time, but unfortunate outcomes are also plausible, resulting from lack of institutionalised processes, gaps in skills and issues arising from existing family relationships dynamics.

This thesis attempts to determine and quantify the factors of family-owned businesses in Estonia that are most likely to affect their profitability. Thus, the research question is: ‘What factors, financial parameters and determinants of family business structure have the potential to positively predict company’s performance in terms of its profitability?’

To answer this research question, three hypotheses were introduced.

1. *H1: "Debt leverage and management are predictors of profitability in family-owned businesses"*
2. *H2: "Current assets turnover is a predictor of profitability in family-owned businesses"*
3. *H3: "Tangible assets ratio is a predictor of profitability in family-owned businesses"*

The empirical part of this thesis will take a closer look in to the correlation between returns on equity, assets, invested capital and various indexes and ratios of Estonian family-owned companies. The timeframe for this research is 2008–2010 and 2020–2022. The reason for this timeframe is that it allows to see directly the contrasting performance during different economic backgrounds, this enables the mitigation of time trends, facilitates better comparison to previous research and sets up this study to be of more relevancy.

To explore the hypotheses, statistical parameters were calculated for Estonian companies and compared with results reported for other countries. An ordinary least squares model was calculated making it possible to identify the exact predictor of profitability. The results of the regression were compared to the similar research in the field.

In the following sections of this thesis, the research question and hypotheses will be discussed in more detail. First, economic theories and background information will be presented justifying the selection of the hypotheses. Then, previously reported research will be reviewed, summarising the findings and revealing the contradictions. Following that, data collection process and used methodology will be presented, providing explanation of this study internals. In the next part, the collected data are analysed and possible interpretations are discussed. Overall findings and conclusions will be presented in the final section.

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1.1. Theory review

Family business capital structure is unique compared to publicly traded companies, in a sense that it presents a different dynamic. Although there are possible downsides, various economic theories suggest that family ownership structure can be the reason for improved company performance under certain circumstances.

Traditional agency theory points out possible conflicts of interest between managers and shareholders of public companies. Managers are prone to placing self-interests above the maximization of shareholder value (Jensen & Meckling, 2019). Family ownership structure has the potential to mitigate this problem by aligning the goals of the management (who are often family members) with the long-term business success. The reputation of the family and its wealth are linked to the company's performance, thus encouraging managers to commit to decisions that benefit the company in the long run. Stewardship theory extends this idea by pointing out that family businesses often have a long-term perspective compared to publicly traded companies, which are usually under pressure of short-term stock market dynamics (Davis *et al.,* 2018). Family owners tend to prioritize the sustainability and long-term growth of the company over the short-term profits. These views often manifest in investments in various aspects of business, such as: development, employee training, building a strong brand reputation. This ultimately improves long-term profitability.

Pecking order theory suggests a potential profitability advantage for family-owned businesses compared to their publicly traded counterparts. It suggests a hierarchy of financing preferences for firms, with internal funds being the most preferred due to their low cost. Debt financing comes next, followed by equity issuance as a last resort (López-Gracia & Sogorb-Mira, 2008). As previously mentioned, family-owned businesses are driven by a long-term perspective and a desire to maintain control, might be more likely to prioritize retained earnings and limit their external financing. This conservative approach leads to a lower debt-to-equity ratio, thus reducing financial risks and the associated interest expenses that can reduce profitability. Furthermore, the decreased

pressure from shareholders to maximize short-term profits allows family-owned businesses to reinvest their earnings back into the company, promoting growth and thus profitability.

Transaction cost economics suggests that family members may be more willing to openly share information and make decisions together, which leads to faster and more efficient allocation of resources (Williamson, 1998). This way family capital structure can simplify decision-making processes by reducing the need for extensive bureaucracy and external contracts. This results in reduction of transaction costs associated with contract negotiations and monitoring, potentially increasing overall efficiency. Social capital theory adds another layer to this effectiveness. The strong sense of community and shared purpose developed by a family business can lead to higher levels of trust, cooperation and commitment within the organization (Bhandari & Yasunobu, 2009). This correlates to increased productivity, innovation and a more positive work environment and thus profitability.

Family businesses often place great emphasis on the transfer of knowledge from one generation to another. Knowledge diffusion theory suggests that such accumulated institutional knowledge and experience specific to operations of a company can be a source of competitive advantage (Chen & Hicks, 2004). Family businesses retain experience and expertise that can lead to better decision making and thus increased profit.

Family-owned businesses, while acknowledged for their close-knit structures and long-term vision, face inherent risks that can hinder their sustainability and profitability. Challenges of management can arise, as informality and over-reliance on family ties might lead to unclear decision-making processes (Steier *et al.*, 2015). Additionally, uncertainties with succession mechanisms can lead to difficulties in transitioning leadership to future generations. Financial risks could increase as a result of an overdependence on internal funds, which might limit access to capital for growth. Similarly, excessive debt due to a reluctance to relinquish control might add to instability. Additionally, short-term focus on values of family can be in conflict with long-term decisions needed for future success (*Ibid.*).

A whole set of risks can be linked to the operational activity. A lack of formal strategic planning or emotional decision-making, influenced, for example, by family dynamics, can lead to missed opportunities or strategic mistakes. In some cases, family businesses may have difficulty attracting and retaining top talent from outside the family, potentially limiting their access to valuable skills and experience. Consequently, family businesses may also face limitations in raising capital

compared to publicly traded companies, potentially limiting their ability to invest in their growth opportunities (*Ibid.*).

Overreliance on family members may be detrimental. In the event of death of one the members, there is a substantial risk of such businesses ceasing to exist (Ward, 1997). Due to family dynamics, it may be harder to replace the specialized worker in an acceptable time span. It is also worth mentioning, family conflicts, such as political disagreements, romantic blunders, or self-identification discord, can destroy a business on their own. The hardest event for a family business to survive is usually the transition to the next generation (*Ibid.*). It is hard both for people to give up their ruling positions and manage the transition of power without wreaking havoc.

For the reasons stated above, various countries create institutions to help resolve the problem of generational sustainability of family businesses. In Estonia, it's the *Eesti Pereettevõtjate Liit* (The Association of Estonian Family Entrepreneurs). The mission of the Association is to support the generational development and sustainability of family businesses, valuing the entrepreneurship and long-term sustainability of the Estonian family. The implications of this will be discussed in the following sections of this thesis.

Overall, family ownership is not a guarantee for increased productivity. However, with correct implementation, it can create a unique environment that has its clear advantages.

1.2. Empirical review

Previous research by Statistics Finland and The Finnish Family Firms Association has found positive relationship between family ownership and some measures of firm performance (ROI, Net Profit) and that financial leverage play a very important role in the firm's health (Siakas *et al.*, 2014). This study also looked at other variables than percentages of ROIC and ROE, i.e., it focused on the capital structure of the firm and intrafamily relationships (*Ibid.*). It predicted that the following simple variables, that are also relevant to this thesis, could be used for comparison of business outcomes: ROIC, ROE, equity ratio and profit margin. Overall, the profit margin of Finnish companies was shown between 2.9 % and 3.6 %, depending on their size and structure. Finland's family businesses had ROIC of 8.25 %, while for non-family companies it was 4.7 %. Other statistical parameters followed the same suite. Additionally, the Equity ratio for the studied

sample was 42 %. The study made a conclusion that family businesses are more profitable than non-family-owned ones.

Likewise, a Romanian study suggests that the influence of fixed assets, turnover, price earnings ratio, duration of current assets by turnover and leverage could be significant (Popa & Ciobanu, 2014). However, it points out drawbacks of using these indexes, one example being that profitability of a company cannot be explained only by microeconomic factors or the trend of a particular industry alone (*Ibid.*). This study was done for the period of 2009–2012 and it provides a more detailed financial research. The suggested model can accurately predict changes of ROE and ROIC, with an R squared of 60 % (*Ibid.*).

The results of this study differ substantially from the previous one. Firstly, the authors showed that Revenue had effect on dependant variables. In their study, it positively affected ROE and negatively ROIC at a significance level of 1 %. Secondly, their solvency ratio appears to have negative impact on dependent variables at lower significance levels, but with higher coefficients. Thirdly, they found out that the Current asset turnover ratio has an impact on equity, but only little on invested capital. Lastly, ROE and ROIC in their study were found to be 7.02 % and 8.53 % respectfully.

Studies that accepted agency theory as the basis for their hypotheses, found a positive correlation between a family constitution and performance. One such paper discussed the results of interviews of company members conducted by psychologists that worked with family boards. It was found that companies that have strong cooperation between members or which use the services of specialized family consultants generally have better performance, which correlates with agency theory (Arteaga & Menéndez-Requejo, 2017). Another paper confirmed this positive relationship and outlined multiple types of cooperation, calling for further, more specialised research (Zellweger & Nason, 2008).

In contrast, another Finnish research arrived at quite opposite conclusions. Their financial findings showed that non-family-owned firms have slightly better financial indexes and overall show no significant financial differences from family-owned companies (Hansson *et al.,* 2014). Additionally, authors found that in line with previously published literature, family chief executive officers (CEOs) had a positive effect on ROA and ROI, however this effect reduced over time (*Ibid.*). This study on unlisted small and medium enterprises showed that the averages for ROA

and ROIC were 14.79 % and 20.80 % respectively for family businesses and 16.28 % and 25.54 % respectively for non-family ones (*Ibid.*).

A Brazilian study suggests another view on family business and outlines additional possible reasons for their increased financial performance. The study found that non-economic objectives are additional goals that shape firms' identity, and correlate with higher commitment to longevity of management boards (Alves & Gama, 2020). The authors highlight how family businesses experience success whenever they display strong cultures of commitment and values. The study found that family members who identify with the firm and express feelings of commitment increase their respective levels of responsibility, which leads them to adopt behaviours that are favourable for business success and tend to be protective of the company (*Ibid.*).

Another study has found out a noticeable difference between accounting performance of firms, and noted almost no difference when evaluating market performance (Mazzi, 2011). The paper was discussing the works of other authors in the post 2000's years. It had evaluated other people methods, approaches and findings. This study evaluated publicly traded firms, looking at the effects of family-CEOs. The study notes that there is a statistically significant correlation between performance and company structure, however it notes that the amount of difference is small. It calls for better methods of research and points out what exactly can be improved in future research.

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Additional study done on the influence and importance of management board participants continue to paint a similar picture. It outlines that management boards made up of only family and or non-family participants severely underperform, compared to a board that combines both non-family and family members, in qualitative research (Brenes *et al.*, 2011).

Another research was done on Indonesian family business took a closer look at the relation of management views and company performance. It confirms that purely family management boards correlate to lower performance due to most lacking professional knowledge and skills. The study refers to contingency theory as its basis (Rachelia *et al.,* 2021). This finding is confirmed by a research done in Tallinn University of Technology, which found that students are not thrilled by their families' businesses and usually seek out career choices that are different from what their family pursues (Sille Talumets, 2015).

A paper about the influence of family dynamics in business performance reports positive findings. It suggests that the introduction of family management has a positive influence on workers view of the business. Thus, in the long term, leads to increased profitability (Maharajh *et al.,* 2023). The authors found that higher employee number in family-business leads to better management and more effective leadership, which positively contributes to the business performance.

Further study on SME growth across the world has found significant evidence that family ownership structure has a positive impact on firm growth and volume of trade. However, it also shows evidence for such capital structure having negative impact on the size and profit margin of firms (Miroshnychenko *et al.,* 2021).

Research of Mexican publicly traded firms have conducted that the concentrated ownership in family businesses does indeed reduce agency costs. It points out that family owners have a long-term interest in the success of the company and are more likely to make decisions that maximize wealth. This was done using surveys and direct interviews of numerous small and medium sized businesses (San Martin-Reyna & Duran-Encalada, 2012).

A study on Polish market of 2012 sheds some light on profitability indexes of SMEs. It was found that small sized businesses on average have profit margin of 4.8 % and medium sized of 4.1 % (Hyz & Gikas, 2012). A paper on capital structure reported that return on assets is a predictor of profitability, and states that the average ROA for British SMEs in early 2000's was 7.3 % (Yapa Abeywardhana, 2015). Using theoretical background, it also suggests that Tangible asset ratio might be a predictor of profitability due to the structure of British economy and the behavioural preferences of business owners at that time (*Ibid.*).

Another research looking into the differences between having mixed and fully family management boards found that mean profit margin for SMEs was 7.91 % and mean ROA was 15.13 % (Soininen,

et al., 2012). Through regression it was found that size of the company and revenue have positive impact on profitability. A similar study reported that wood harvesting contractors in Finland had Return on equity of 9.5 %, Return on assets of 4.1 % and Return on investments of 4.9 % (Penttinen, *et al.*, 2011). Another similar study done on unlisted firms suggested that Profit margin for SMEs might be around 11 % and that amount of personnel correlates to profitability (Tourunen & Laaksonen, 2009). A Spanish study found that average Return on assets was 7.92 % and that the company size might not be the predictor of profitability (García-Teruel & Martínez-Solano, 2007).

All papers acknowledge their limitations, that it is impossible to say with a 100 % certainty whether a family business model is more successful without taking into consideration all outside and inside factors such as inflation, government policies at the time, market mood, size, growth opportunities, conflicts between workers, business structure and the type market field.

1.3. Hypothesis development

After studying available literature on the economic profitability of SMEs, it becomes apparent that family business structure is a phenomenon in its own right introducing a specific dynamic to common business processes and outcomes. For this thesis, the research question is: does family business structure improves company performance?

To explore the matter, a total of three hypotheses were introduced, after breaking the research question into its core components. This approach allowed to focus on one simpler, more manageable research task at a time. All three components were finally analysed together to facilitate the creation of a new knowledge based on processes of synthesis through combination.

H1: "Debt leverage and management are predictors of profitability"

Taking into the account theories discussed in section 1.1, we can assume that debt leverage might be a predictor of profitability. This is supported by the stewardship theory, which suggests that family businesses exhibit a greater focus on ensuring long-term business outcomes compared to publicly traded companies. Such focus on sustainability leads to better decision-making regarding investments, cost management, and overall financial health. Family-owned businesses tend to take on liabilities that are more attractive for the business. The agency theory suggests that such companies have shorter asset turnover and manage to arrange their debt in a way that it follows

cash conversion cycles. It was managed to identify an abundance of studies and other literature sources to support this hypothesis.

H2: "Current assets turnover is a predictor of profitability"

This hypothesis is based on the same assumptions and theories which have been used for the first hypothesis. With less agency costs and decisions made quicker, the expected assets turnover is likely to happen faster. Faster assets turnover results in less inventory spoilage, the efficient use of resources, more satisfied customers and revenue made quicker. This, in turn, translates into higher profitability, as the company needs to tie up less money in inventory and receivables, frees up cash for other purposes and potentially reduces costs associated with holding the inventory.

H3: "Tangible assets ratio is a predictor of profitability"

Assuming that family businesses are more conservative in their decision making and taking into account the claims of the pecking-order theory, it could be expected that family businesses prefer equity over debt unlike ordinary firms. Considering previously mentioned research, family businesses appear to be more inclined to acquiring higher amounts of tangible assets.

2. METHODOLOGY

2.1. The note on the use of Artificial Intelligence

In this thesis, generative Artificial Intelligence (AI) capabilities were used to help the author gather and better understand information on relevant economic theories, as well as certain economic metrics used in the study.

2.2. The datasets and study subjects

The datasets used for this study include data on micro, small and medium-sized businesses for the years 2008–2010 and 2020–2022. There are several reasons to divide the available data in two chunks using these two periods.

First, it allows to see contrasting performance in different economic environments. Second, it mitigates the influence of trends over time. Over long periods of time, economic trends, industry changes, and overall business practices evolve significantly. This is especially true for the period of the new millennium, since computer technologies were developed and implemented at fast rate. Splitting the data into two shorter periods helps control for these broader time trends. This allows the research to focus more specifically on the unique characteristics and strategies of family businesses that contribute to their profitability, rather than attribute changes in profitability solely to long-term economic shifts. Third, it enhances the relevance of findings for contemporary businesses. By focusing on data from a more recent period (2020–2023), the research findings gain greater contemporary relevance. This allows for a more nuanced understanding of how family businesses are navigating the current economic landscape, potentially shaped by factors like technological advancements or globalization. Fourth, it allows for a better and more faithful comparison with the past research, which was mostly focused on economy around the recession of 2008. And, as well as recent studies that were done for the years 2017–2022.

Overall, splitting the data into two chunks representing these distinct periods offers a richer and more insightful approach to the research. By analysing family business performance across contrasting economic contexts and controlling for broader time trends, the research can generate

new knowledge about the factors that contribute to the long-term success of these unique business entities.

Per European definition of a family business, a business is considered to be a family-owned if it has the characteristics as listed below (European Commission, 2007):

1. Most decision-making rights are owned by the individual(s) who founded the firm, or the individual(s) who acquired the share capital of the firm, or the property of their spouses, parents, children or direct heirs of children.
2. Most decision rights are indirect or direct.
3. At least one representative of the family or relatives formally participates in the management of the company.
4. Listed companies meet the definition of a family business if the person who founded or acquired the firm (share capital) or his family or descendants have 25 percent of the decision-making rights provided by their share capital.

The companies in the dataset were confirmed to have characteristics of family-owned by *Eesti Pereettevõtjate Liit*. The Estonian family entrepreneur's organization has a list of their members for public viewing. This organization helps family companies to resolve internal conflicts of management and transfer business from one generation to another by offering professional help. A list of members was compiled from freely available information. Financial information about them was hand-picked from 268 yearly reports that were downloaded from Estonian E-business register.

The number of companies analysed was originally 89, but it was decided to only consider those that have operated for 10 years or longer, which decreased the list to 60 companies. The companies for which there was not enough information to perform a rigorous study, were eliminated. In addition, companies with uncharacteristic financial data that is considered to be an outlier, were filtered. And, companies that did not fall under the definitions of micro, small and medium businesses were discarded. All these actions left only 42 entities. As per European Commission, the definition of small and medium sized businesses is presented in Table 2.1.

Since the information about the staff headcount was unavailable, turnover and balance sheet total were used to define the size of businesses for filtering. The indicators used in this thesis that quantify the performance of the company are return on equity (ROE), return on invested capital

(ROIC) and return on assets (ROA). To see their influence, additional factors that are considered indicators will be presented below.

Table 2.1. Definition of the size of the business

Company category	Staff headcount	Turnover	Balance sheet total
Medium-sized	< 250	≤ € 50 M	≤ € 43 M
Small	< 50	≤ € 10 M	≤ € 10 M
Micro	< 10	≤ € 2 M	≤ € 2 M

Source: European Commission, 2006.

Return on invested capital measures the quality of management and resource allocation in SMEs. This indicator quantifies the efficiency of company assets. Investors and management usually measure the performance of capital structure by dividing income by total assets. Due to a tax system in Estonia, there is no need to account for tax shield, and thus the net income remains as is. Additionally, not all assets are being used by the firm at all times or being accounted for, so it is better to use net working capital instead. Thus, the entire profitability of the company's capital structure can be taken into the account. This measure stems from returns on assets, but it is different.

$$ROIC = \frac{NI}{NWC} \qquad (1)$$

where

ROIC: Return on invested capital, |
NI: Net income,
NWC: Net working capital.

Return on equity is a key metric for calculating a company's profitability in relation to its shareholders' investment. Unlike ROIC, it measures how much profit a company generates for each dollar of shareholders' equity. A higher ROE indicates that factors like strong operational efficiency, successful investments, or a healthy profit margin are present within the company. However, it's important to understand that desired ROE differs between industries and regions. Therefore, ROE analysis is most valuable when compared to peers or own company historical performance, to provide a more nuanced understanding of its profitability and its efficiency in utilizing shareholder capital.

$$ROE = \frac{NI}{E} \quad (2)$$

where
ROE: Return on equity,
NI: Net income,
E: Total Equity.

Return on assets provides a complementary perspective on a company's profitability by evaluating how efficiently it utilizes its assets, not just shareholders' equity. A high ROA indicates that the company is able to well utilize its resources, including property, equipment, inventory, and even intangible assets like brand recognition. This efficiency in asset utilization translates to a stronger ability to convert resources into profits. Important to note that interpretation of ROA is as the same as previously mentioned in ROE, requires consideration of outside and time-trend factors

$$ROA = \frac{NI}{A} \quad (3)$$

where
ROA: Return on assets,
NI: Net income,
A: Total Assets.

In the case of these variables, they had to be filtered in the dataset. There were numerous cases where return on equity and invested capital are over positive and negative 200 %. These outliers were discarded. In addition, some adjustments had to be made. Since Estonia had a its own currency from 1997 to 2011, a new variable was created “Adjusted Revenue” in order to use it in the regression. The data for revenue in the first period was adjusted for exchange rate of 15.65 EEK to 1 EUR.

It was considered to also take into account Coverage of Interest ratio. Unfortunately, 73 % of companies either don’t state their interest payments in the yearly financial reports, or pay so little that it considerably skews the data. 40,000 % and above are a norm in the dataset. In the analysis there also was debt financing metric. Unfortunately, it also had to be removed since it has too many missing values and it was not possible to compare to other research. Instead, it was decided to use profit to debt ratio, to evaluate debt profitability in the context of leverage.

The data collected and used is made available on Google drive by the author. To compare the data with other research, summary statistics are compiled for the indexes available and comparable. A summary of the data is given in Table 3.1 and is further explored in Results section.

To answer hypothesises, a regression needs to be created. To test the multicollinearity of data, correlation matrix has been made for all the indicators that were available and relevant to the profitability of a firm, such as: adjusted revenue, profit margin, debt to equity ratio, tangible assets ratio, profit to debt ratio, current assets turnover, equity ratio. After compiling a correlation matrix (which can be found in Figure A1.1 in the appendix), it was clear that some variables have multicollinearity problems. Ultimately, it was decided to discard equity ratio due to its significant intercorrelation with independent variable of interest, and the fact that it provides very similar data. It was decided to keep profit margin, to avoid omitted variable bias. Since it is what ultimately decides profitability, and still effect the data even if not included. To see the difference between the business sizes, it was decided to use revenue as a context giving variable. This filtering only left 6 variables to use: 1) Tangible asset ratio, 2) NI/L ratio, 3) Current asset turnover, 4) D/E ratio, 5) Revenue, 6) Profit margin.

$$TANG = \frac{Tang\ A}{A} \qquad (4)$$

where

TANG:	Tangible assets ratio,
Tang A:	Tangible assets,
A:	Total Assets.

The tangible asset ratio (TANG), while not itself a direct measure of profitability, can provide valuable information about a company's profit potential, especially for businesses that rely heavily on physical assets to operate. This ratio informs how much income a company can generate from every euro invested in tangible assets. A company that takes good care and use of its physical assets is more likely to get the most out of them. This results in increased productivity and potentially lower production costs, ultimately leading to increased profits.

The Net income/Liabilities ratio (NI/L) essentially measures how much net income a company generates for every dollar of its liabilities. A higher ratio suggests that the company is able to convert more of its revenue into profit after servicing its debt obligations. This indicates a potentially stronger financial position and more efficient use of debt capital. Companies with high

NI/L ratios may be more attractive to investors looking for firms that can generate healthy profits despite having debt.

$$CAT = \frac{Cur\ A}{Rev} \qquad (5)$$

where
CAT: Current asset turnover ratio,
Cur A: Current assets,
Rev: Revenue.

Current asset turnover ratio (CAT) sheds light on a company's operational efficiency in managing its current assets, namely cash, inventory and accounts receivable. Lower inventory levels and faster receipt times can result in lower inventory costs, insurance costs and potential bad debt write-offs. This results in healthier profits and an increase in profitability. Yet, it is important to understand that a very high CAT score is not always the end goal. There may be a trade-off between efficiency and profitability. For example, a company may prioritize extremely fast inventory turnover by selling its products at lower prices. While this increases the CAT ratio, it can also result in lower margins, potentially reducing profitability.

The debt-to-equity ratio (D/E ratio), provides insight into a company's financial structure and its ability to manage debt. It does not directly predict profitability. However, it provides important information about a company's potential to generate sustainable profits over the long term. A strong equity base gives a company more flexibility to make strategic investments without worrying about unsustainable debt obligations. Additionally, lenders and investors generally view companies with low debt levels as less risky. Which correlates to profitability.

$$PM = \frac{NI}{Rev} \qquad (6)$$

where
PM: Profit Margin,
NI: Net income,
Rev: Revenue.

Revenue is used to see if the change in the size of the company has a significant change in its operations. And the profit margin is used to avoid omitted variable bias, since it is important for the context of other variables.

Further in the analysis part, the Equity ratio will be presented. It was compiled for comparison purposes only. It measures the amount of leverage used by a company (debt management). It is total Equity divided by total Assets.

For this research it was decided to limit the significance level to 5 %. The data is vast, but there is not too much of it to justify 1 %. Before getting the data, ordinary least squares model was created in excel and residual plots were created to see if there are any problems with heteroskedasticity. It turned out that yes, the data suffers from this problem, it is shown in the Figure A1.2 in the appendix.

For this reason, further regressions are created with robust standard errors to account for this issue. After creating each of the models, their variable inflammatory factors (VIF) were checked, this was done using available tools in the Gretl software. The VIFs of all models are in the range of 8 to 13. Since the model only cares about the predictability, the results are satisfactory.

To further account for the passage of time and to see if there are any time trend differences a dummy variable for years was created. Overall, 3 regression models were made, one for all periods, one for the period of 2008 and for the period of 2020. There were noted no significant changes except for one, which is discussed in the analysis part. It was determined that the use of the average model is acceptable.

The following regression is used on all indexes of profitability (ROIC, ROA, ROE):

$$Profitability\ index_i = \begin{matrix} a + b_1 CAT_i + b_2 Lev_i + b_3 Rev_i + \\ + b_4 PtD_i + b_5 Tang_i + b_6 PM_i + \varepsilon_i \end{matrix} \qquad (7)$$

where

Profitability index$_i$:	company *i* return on equity or return on assets or return on invested capital,
CAT_i:	current asset turnover *i*,
Lev_i:	D/E ratio *i*,
Rev_i:	adjusted revenue *i*,
PtD_i:	profit to debt ratio *i*,
$Tang_i$:	tangible assets ratio *i*,
PM_i:	profit margin *i*,
ε_i:	residual term *i*.

3. ANALYSIS

3.1. General statistics

Overall, the statistical evaluations performed in this research show that the average values of the key profitability parameters of the studied family-owned firms are higher than the literature-reported results of non-family-owned companies. Most parameters exceed findings from studies of data from Finland, Romania, Britain, Poland and Spain. The only notable exception to this was a case study of small businesses in Finland which showed profitability indexes around two times higher than we found for Estonian companies (Soininen *et al.*, 2012).

For the family-owned companies in this study, it has been established that ROE and ROIC are at around 14 %, with ROA being somewhat lower at 8 %. This finding, along with high D/E and NI/L ratios, suggests that Estonian companies might have a lower leverage compared to other countries and demonstrate a better ability to realise debt into income. This estimation is confirmed by nation-wide Finnish research on SMEs, which reports the average equity ratio of 43 % (Siakas *et al.*, 2014). The key statistical findings of the Finnish study by Siakas *et al.* (2014) are provided in Table A2.1 in the appendix.

Table 3.1. Summary of key statistical indexes describing profitability

Variable	Mean	Std. Deviation	Median	Perc. 10	Perc. 90
ROE	0.1411	0.2663	0.1071	−0.0913	0.4755
ROIC	0.1444	0.2606	0.0972	−0.0731	0.3864
ROA	0.0807	0.1213	0.0562	−0.0541	0.2322
Profit margin	0.0597	0.1487	0.0521	−0.0578	0.2271
D/E	1.5221	2.3104	0.6159	0.1273	4.5223
Tangible assets ratio	0.3231	0.2685	0.2242	0.0172	0.7215
NI/L	0.3191	0.6858	0.1521	−0.0755	1.3128
Current asset turnover	0.5660	0.5755	0.3979	0.1803	1.0858
Equity ratio	0.5766	0.2457	0.6188	0.1811	0.8871
Revenue, €	5,18 M	7,59 M	2 M	61 K	15,76 M

Source: Author's calculations.

Noteworthy, values of ROIC were expected to be approaching those of ROA, but they had a tendency to approximate ROE instead, as can be seen for the distribution of average values of the dependant variables over the years in the Table 3.2. It is also of interest that the net working capital of Estonian family-owned companies is very close to their equity, which is another confirmation of the finding that these companies are reluctant to use debt as a financing instrument.

Table 3.2. Average values of profitability indexes throughout the years

Year	ROIC, %	ROE, %	ROA, %
2008	16.5	16.5	8.9
2009	5.4	7.9	5.5
2010	16.6	15.2	7.4
2020	14.5	15.6	9.4
2021	17.3	17.6	9.1
2022	15.8	11.6	7.9

Source: Author’s calculations.

Comparing our findings to a larger sample of SMEs across the globe, it could be seen that the studied family-owned companies have higher returns on equity, invested capital and assets, by almost two times. Interestingly, profit margin difference was found to fluctuate between regions. For example, for data reflecting all family-owned businesses of Finland, it is on average 3 %, and for Poland it is 4 %.

However, other smaller studies of family-owned SMEs in Finland found that their profitability indexes were higher than those of Estonian companies. One such study finds that the ROIC should be 25 %, which is almost two times more than the findings of this study; the similar discrepancy was for ROA, which was reported at 20 % (Hansson *et al.*, 2014). The available data for family-owned businesses reveal that ROA and ROIC are expected to be around 15 % and 20 % respectively (*Ibid.*). Another study on growth opportunities reported similar findings, with ROA at 16 % (Soininen *et al.*, 2012).

These research make it seem like the family-owned companies are significantly less profitable than they are. Which leads to the speculation that previous small-scale studies might have had a problem with sample bias and or time trends bias. The sample bias occurs when the sample used in a study isn't representative of the entire population the research intends to investigate. This might lead to misleading or inaccurate conclusions that can't be generalized to the broader population.

Time trend bias occurs when historical trends, unrelated to the study's variables, influence the results. This can make it seem like a factor under investigation is the reason for the observed effect, when, in reality, it's just a reflection of the general passage of time. The aforementioned studies, showing contradictory results, investigated financial outcomes of the businesses for only one financial year. By contrast, in the paper on a wood contractor, the authors studied financial outcomes for the duration of 7 consecutive years, revealing different results and making conclusions similar to findings of this study. It estimated ROE, ROA and ROIC to be 9.5 %, 5 % and 4 % respectively, which is closer to the Finnish national average (Penttinen *et al.*, 2011). The conclusion is made that time trends bias might considerably influence the reliability of the obtained data and its interpretation. This is accounted for in section 3.2 when reporting regression results.

As previously discussed in the section dedicated to the theory review, the approach by Association of Estonian Family Entrepreneurs to categorise firms as family-owned businesses, or otherwise, most likely have affected the selection of the companies to be included in the data sample. The classification they utilised was conceived with the goal to facilitate the resolution of family conflicts around family-owned businesses. As this organization was created in 2014, it’s unlikely that the selection of companies in the first analysed period could be a source of much bias. Furthermore, the dynamics of average values of profitability indexes over the years (see Table 3.2) reveals the minimal changes over the years, which implies that the Association may not have had much effect on the profitability outcomes. This conjecture supports the idea that the selected source of information did not produce any major sample bias in this study.

3.2. Regression analysis

Overall, the P values in the resulting model were very close to zero, indicating that the relationships observed in the sample will also exist in the larger cohort (i.e., they are statistically significant). The significance level is 30.7 % for the ROIC model, 34.7 % for ROE, and 63.8 % for ROA. The prediction capability of these models above 30 % is great for the level of individual firms. This finding is also supported by other studies on SMEs, whose research models fall in the range of 12–32 % (Holopainen, 2021). The time trends have been taken into account by introducing year dummy variables. The combined model for the first and the second periods does not differ from either of the period-specific models. The only notable difference is that in models for the more recent years Tangible assets ratio became significant for the ROE model. Yet, it still falls over the

significance level chosen for the analysis and so does not meet the significance requirements. The statistical findings for combined data are presented in Table 3.3, and findings for separate periods are in Table 3.4 and Table 3.5 below.

Table 3.3. Results of LOS regression, combined years

	ROIC			ROA			ROE		
	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance
Constant	0.210	0.060	***	0.079	0.019	***	0.126	0.058	**
Current asset turnover	−0.081	0.033	**	−0.033	0.014	**	−0.073	0.030	**
D/E	−0.005	0.006		−0.004	0.002	**	0.000	0.015	
Adjusted revenue	0.000	0.000		0.000	0.000		0.000	0.000	
Profit to debt ratio	0.024	0.024		0.083	0.015	***	0.069	0.026	***
Tangible assets ratio	−0.143	0.065	**	−0.060	0.023	***	−0.099	0.057	*
Profit margin	0.767	0.212	***	0.312	0.073	***	0.774	0.195	***
Year FE		Yes			Yes			Yes	
R^2		31 %			64 %			35 %	
Adjusted R^2		27 %			61 %			31 %	

Source: Author’s calculations

Note:

Symbols *, **, *** represent significance levels of 10 %, 5 % and 1 %, respectively.

Table 3.4. Results of LOS regression, first period

	ROIC			ROA			ROE		
	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance
Constant	0.210	0.055	***	0.080	0.016	***	0.152	0.040	***
Current asset turnover	−0.081	0.032	**	−0.033	0.014	**	−0.072	0.030	**
D/E	−0.005	0.006		−0.004	0.002	**	0.000	0.015	
Adjusted revenue	0.000	0.000		0.000	0.000		0.000	0.000	
Profit to debt ratio	0.025	0.023		0.084	0.015	***	0.072	0.026	***
Tangible assets ratio	−0.142	0.065	**	−0.059	0.023	***	−0.095	0.058	
Profit margin	0.766	0.210	***	0.311	0.073	***	0.768	0.192	***
Years adjusted		Yes			Yes			Yes	
R^2		31 %			64 %			34 %	
Adjusted R^2		28 %			62 %			31 %	

Source: Author’s calculations

Note:

Symbols *, **, *** represent significance levels of 10 %, 5 % and 1 %, respectively.

Table 3.5. Results of LOS regression, second period

	ROIC			ROA			ROE		
	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance	coeffi-cient	std. error	signifi-cance
Constant	0.194	0.057	***	0.081	0.017	***	0.156	0.047	***
Current asset turnover	−0.080	0.032	**	−0.033	0.014	**	−0.073	0.030	**
D/E	−0.005	0.006		−0.004	0.002	**	0.000	0.015	
Adjusted revenue	0.000	0.000		0.000	0.000		0.000	0.000	
Profit to debt ratio	0.026	0.024		0.083	0.015	***	0.069	0.026	***
Tangible assets ratio	−0.142	0.065	**	−0.060	0.023	***	−0.099	0.057	*
Profit margin	0.781	0.209	***	0.307	0.072	***	0.776	0.192	***
Years adjusted		Yes			Yes			Yes	
R^2		31 %			63 %			35 %	
Adjusted R^2		27 %			61 %			32 %	

Source: Author’s calculations

Note:

Symbols *, **, *** represent significance levels of 10 %, 5 % and 1 %, respectively.

Both dependent variables average out at 14 %, and for returns on equity they average at 8 %. The regressions predict small amount of the sample very well, which is shown by the significance levels. Overall, it is calculated that Profit-to-debt ratio is a good predictor of Returns on equity and assets, but not invested capital; its coefficients are quite high, at 8 % and 7 % respectively. Leverage turned out to be an important predictor only for assets. However, its coefficient is quite low (−0.3 %), meaning that it can't be confidently used to prognose dependant variables. Tangible assets ratio turned out to be a good predictor for returns on invested capital. Current asset turnover is a consistent predictor of profitability. Its significance is acceptable for all variables and coefficients are big. It is −7 % for ROE and ROIC, but only −3 % for ROA. Size of the company showed to have no relation to profitability.

It is important to point out that each of the predictors is influenced differently by other variables. There are, apparently, some overarching relations that present themselves throughout the whole dataset, like for Current asset ratio. But overall, the effects of each of the parameters are rather unique.

The findings of a study with a similar design confirm the results of this research. In the reference study, the debt management ability was found to be a good predictor of profitability (Popa & Ciobanu, 2014, p. 183). The authors also showed that coverage of interest, solvency ratio and current asset turnover were all of big prognostic significance. Interestingly, the company size was also found to be a predictor of profitability in their study. Their findings are presented in Table A2.2 in the appendix.

H1: "Debt leverage and management are predictors of profitability"

With the obtained data, the first hypothesis needs to be partially dismissed. It was shown that the debt structure only influences the ROA and does not predict the other two indexes. However, the ability to realise debt into income does influence ROE, but leaves the ROIC unaffected. A similar study confirms that the debt and asset management are predictors of profitability. All these factors make the first hypothesis partially rejected, since results are not uniform for all profitability indexes.

H2: "Current assets turnover is a predictor of profitability"

It has been found that current asset turnover is a good predictor for all dependent variables. It is consistent with the passage of time. Its coefficients are at an acceptable level and its influence is backed up by others research. Thus, the second hypothesis can be accepted.

H3: "Tangible assets ratio is a predictor of profitability"

The results of the model clearly show a strong correlation between ROIC and ROA, but not ROE. Although the data describing the latter parameter slightly differ for the second period, it still does not show enough significance. This finding makes the third hypothesis partially rejected.

CONCLUSION

The aim of the research was to determine factors driving profitability of Estonian family-owned firms. The methodology used was to identify and collect appropriate data, prepare statistical calculations, run regression analysis on the indexes of profitability, analyse the results and compare them to the findings of previous research.

Capture of data was done through the Estonian E-register. Through the analysis and comparison of statistical parameters, mainly averages, it was established that companies in this study are indeed more profitable than the average non-family-owned firm. At the same time, it has been noted that sample bias and time trend bias could skew the results for the research of this kind.

The ordinary least squares regression model with robust errors to address heteroscedasticity was implemented in the study. To check for the presence of time trends, separate models for both periods were also provided. Although the issue of time trend bias was addressed with two distant time period analyses, the issue of sample bias still remained unattended. Thus, it should be noted that while this research is successful at determining the presence of shift in profitability, the calculated coefficients should be viewed with scepticism.

The highlighted result of this study is validation of the fact that debt leverage and management are only partial predictors of profitability. The variables chosen for analysis in this study can describe only certain predictors, their influence can change over time and, thus, they cannot be used to fully explain the changes in profitability indexes. It was also found that tangible assets ratio is a partial predictor of profitability. This is because it fails to explain return on equity, although the other profitability indexes are well described by it. The second hypothesis, that current assets turnover is a predictor of profitability, was confirmed to be true, as it was found that the increase in assets turnover is a statistically significant, negative predictor. Throughout the analysed periods, this parameter remained a reliable predictor with the same negative coefficient.

For the future research, it would be recommended to study larger samples of companies, while being cautious about selecting optimum time periods for analysis. Additionally, future work should consider diving deeper into the capital structure of both family and non-family-owned firms to better analyse the attributes that contribute to a successful long-term business.

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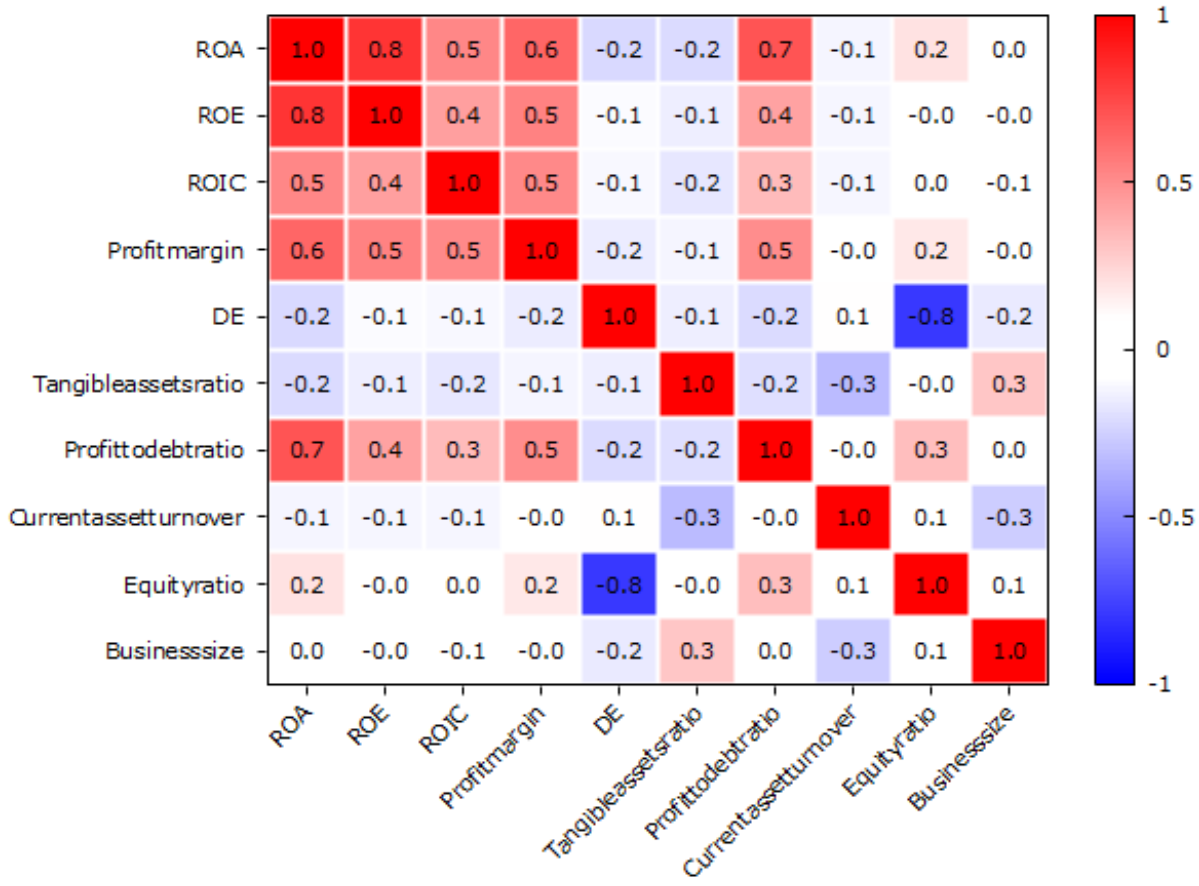
All the data used in this thesis is available on Google drive at:
https://drive.google.com/file/d/1MXWoCd3tZ2kmTtW7WNfU5q2hO7KzkU3k/view?usp=sharing

APPENDICES

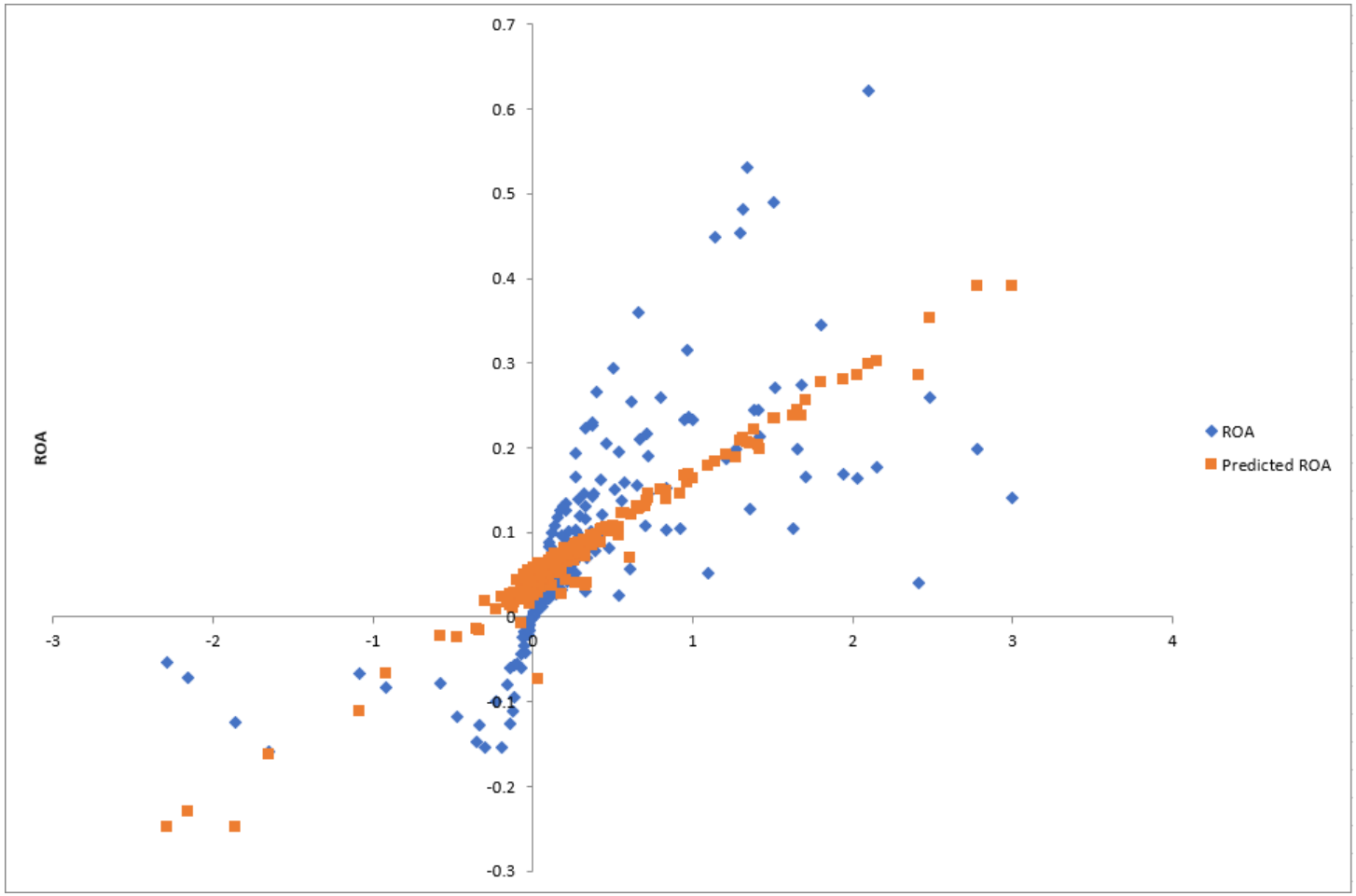
Appendix 1. Author's calculations

Figure A1.1. Correlation matrix



Source: Author's calculations

Figure A1.2 Prediction regression model



Source: Author's calculations

Appendix 2. Other studies data

Table A2.1. Results of the Finnish study by Siakas *et al.* (2014)

	Finnish companies			
	Family		Non-family	
	medium	small	medium	small
Profit margin, %	2.3	2.4	3.6	3.2
ROI, %	8.2	8.3	4.0	5.2
Equity ratio, %	42.7	44.6	42.2	39.7

Source: Siakas *et al.*, 2014, p. 27–29.

Note:

This data was picked by the author for comparison.

Table A2.2. Results of the Romanian study

	ROE			ROIC		
	coeffi-cient	T values	significance levels	coeffi-cient	T values	significance levels
Tangible assets ratio	−0.07	−2.32	**	0.04	1.02	
Revenues	0.02	4.39	***	0.02	−0.74	***
Solvability ratio	−0.02	−2.39	**	−0.01	−0.74	*
Coverage of interest	0.002	5.76	***	0.006	7.49	***
Current asset turnover	0.002	1.19		0.001	3.53	**
Growth opportunities	−0.01	−1.53		−0.001	−2.23	***
Intercept	−0.21	−3.82	***	−0.21	−3.75	***
R^2		66.20 %			72.16 %	

Source: Popa & Ciobanu, 2014, p. 183.

Note:

The symbols *, **, *** represent significance levels of 10 %, 5 % and 1 %, respectively.

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