

DOES SIZE AND AGE MATTER?

**MODERATING EFFECTS IN THE RELATIONSHIP BETWEEN
FAMILY CONTROL AND FIRM PERFORMANCE IN SWEDISH
PUBLIC COMPANIES, 2010-2023.**

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Abstract:

This paper investigates how family control influences firm performance in Swedish publicly listed companies, with a specific focus on how firm size and age moderate this relationship. The study contributes to the existing literature by shifting attention from family ownership to a novel definition of family control, while analyzing it in a unique institutional setting, Sweden, where dual-class shares allow families to retain voting control with proportionally lower ownership. Using a panel data set of 284 Swedish firms from 2010 to 2023, the study employs pooled OLS regression models with year and industry fixed effects to examine both accounting-based (ROA, ROE) and market-based (Tobin's Q, stock return) performance outcomes. The results show that family control has a positive and significant effect on accounting-based performance, consistent with theories of stewardship and agency cost reduction. However, this positive effect is diminished in larger and older firms, supporting the notion that organizational complexity weakens family control's benefits. In contrast, no consistently significant relationship is found between family control and market-based performance measures, suggesting that investors may discount the value of family control, possibly due to perceived risks associated with ownership-control discrepancies emerging from the family control.

Keywords:

Family ownership, Corporate governance, Capital Structure, Financial performance, Active Ownership

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1. Introduction

Family firms represent a dominant force in the global economy, contributing significantly to wealth creation and long-term stability. In 2023 alone, the top 500 family-owned businesses generated over USD 8 trillion in revenues (EY, 2023). Despite their prevalence and economic potency, the governance dynamics within these firms, particularly the distinction between ownership and control, remain underexplored in country-specific institutional contexts. Previous literature proves that family control and ownership can enhance firm performance through mechanisms rooted in agency theory and stewardship theory (Anderson and Reeb, 2003). Families often have a significant portion of their wealth invested in the firm, incentivizing them to reduce agency costs, avoid excessive risk-taking, and adopt long-term strategies that support value-maximizing decisions (Demsetz and Lehn, 1985; Anderson and Reeb, 2003). These effects extend to reduced cost of debt and higher accounting-based performance, particularly when the family is actively involved in management or the board (Anderson and Reeb, 2003; Lwango, Coeurderoy and Roche, 2017). Reputational concerns further motivate responsible governance, as the family name is closely tied to firm success. However, this influence is not without drawbacks. Families may pursue personal or non-financial objectives, limit R&D due to risk aversion and dilution fears, or undermine innovation through nepotism or rigid structures (Burkart, Gromb and Panunzi, 1997; Li and Ryan Jr., 2022). Interestingly, the benefits of family involvement exhibit an *inverted U-shape*, where moderate control outperforms both low and high levels of involvement/control (Reddy and Wellalage, 2023). As firms grow larger and older, the positive effects of family control tend to decline (Lwango, Coeurderoy and Roche, 2017), reflecting increased complexity, generational shifts, and reduced managerial flexibility (Chirico and Bau', 2014; Reddy and Wellalage, 2023). However, and most importantly, Villalonga and Amit (2006) find that the positive effect of family ownership on performance diminishes as control in excess of ownership arises. This occurrence, linked to the negative aspects discussed above regarding risk of pursuing personal benefits and decreased R&D, is particularly prominent in family holdings where the voting control to ownership ratio is high. This problem stems from the inherent risk that families exercise a proportionately higher voting control than their economic incentives represent. According to Faccio and Lang (2002), Sweden has the highest dual-class ownership in the world, where 66.07% of Swedish firms exhibit dual-class structures, which promotes disproportionate voting-to-ownership structures. This, in combination with favorable issuance regulations allowing owners to issue inferior voting rights to foreign investors, allows high ownership manipulation in Swedish companies. Thus, we aim to observe family control's effect on accounting-based and market-based performance in Sweden, where disproportionate voting control is prevalent, while observing moderating effects of firm size and age. These patterns motivate our hypotheses:

Does Size and Age matter?

(H1) Family control positively impacts firm performance.

And;

(H2) This effect is negatively moderated by firm size and age.

To address these questions, we construct a novel panel dataset covering 284 Swedish publicly listed companies between 2010 and 2023. We classify firms as *family-controlled* if the same family or related entity holds at least 20% of the voting rights continuously throughout the designated time period, and actively participates in governance through the board or executive management. This definition accounts for Sweden's unique legal and market conditions, where pyramidal ownership and dual-class share systems are widespread, while being based on factual definitions used in previous literature (Faccio and Lang, 2002; Anderson and Reeb, 2003; Villalonga and Amit, 2006). Ownership data is collected manually using Modular Finance's Holdings platform and cross-referenced with public filings, allowing us to determine active family involvement. Accounting-based Performance is measured using return on assets and return on equity (ROA, ROE), and market-based performance is measured by Tobin's Q and stock return, consistent with prior literature (Anderson and Reeb, 2003; Villalonga and Amit, 2006; Chung and Pruitt, 2007). All financial data is extracted from Refinitiv Eikon.

Our results reveal a positive and statistically significant relationship between family control and accounting-based firm performance. On average, family-controlled firms exhibit higher ROA and ROE than their non-family counterparts. These findings align with the agency theory and stewardship theory perspectives, which posit that family involvement can reduce agency costs, enhance monitoring, and promote long-term strategic vision, particularly when the family is actively engaged in governance.

We next find that this positive relationship is not uniform across all firms. Specifically, interaction models show that the performance benefits of family control diminish with increasing firm size and age. This suggests that as companies grow and become more complex, the advantages of family involvement, such as cohesion, alignment, and informal control become harder to maintain or scale. These results lend support to theories around organizational complexity and generational drift in large family-controlled firms.

Lastly, our market-based performance analysis yields mixed results. We find no consistent valuation premium for family-controlled firms in terms of Tobin's Q or stock returns. A likely explanation lies in the ownership-control misalignment inherent to Sweden's dual-class structures. Investors may perceive high control with limited economic stake as a governance risk, thus discounting the firm's value despite strong internal performance. This is consistent with Villalonga and Amit's (2006) view that excess control relative to ownership can erode investor confidence and mute any market-based reflection of operational success.

The empirical strategy faces several challenges, notably endogeneity concerns due to potential reverse causality, i.e., whether high-performing firms attract or retain family control rather than the other way around. To mitigate this, we focus on long-standing ownership relationships and implement fixed effects to control for time- and industry-specific heterogeneity. All models employ robust firm-clustered standard errors to account for serial correlation and heteroskedasticity. Additionally, we perform winsorization on key variables to address outliers, and robustness checks using varying thresholds of control through voting rights (10–50%) to test for potential non-linear effects such as the *inverted U-shape* proposed in earlier studies (Reddy and Wellalage, 2023).

This paper primarily contributes to the literature on family ownership and control. Anderson and Reeb (2003) find that founding-family ownership enhances both accounting-based and market-based performance in U.S. firms, especially when family members are active in management. Furthermore, we differentiate from the study by broadening the scope of family firms by including non-founding families in the sample. This provides for a broader family firm perspective, and includes companies where families who have bought into the company at an early age. Villalonga and Amit (2006), however, highlight the potential downsides of control in excess of ownership, noting that such discrepancies can dilute valuation effects. Our results extend these findings to Sweden’s institutional context, where control mechanisms are more pronounced, and our novel family control definition builds on and assesses the validity of control’s risk of inferior performance in comparison to ownership. We build on the findings of Lwango, Coeurderoy and Roche (2017), who document that firm size and age negatively moderate the relationship between family control and accounting-based performance (measured by ROA) in U.S. SMEs. By extending this analysis to include both accounting-based and market-based performance in a different institutional and geographical context—larger, publicly listed Swedish firms—we provide additional evidence on the broader dynamics of family control. In doing so, we not only reinforce their findings in a new setting but also contribute novel insights by examining whether the same moderating patterns apply to market-based performance.

2. Theoretical Framework

2.1 Positive effect of Family control and ownership

2.1.1 Ownership and Control definition

Family ownership, in its simplest form, is defined as a firm which is minority, majority or wholly owned by a person/individual or family of relatives (Faccio and Lang, 2002). Subsequently, by solely basing the definition on this requirement, all companies could practically be defined as family owned, and hence Faccio and Lang (2002), Anderson and Reeb (2003), and Villalonga

and Amit (2006) argue that in order to ensure sufficient managerial influence (which is the purpose of examining family ownership), the ownership threshold must exceed 20% of economic ownership rights. In contrast, heterogeneity in different country legislations serves the ownership playing field differently; Sweden's lenient regulations regarding dual-class ownership structures often provides for disproportionately higher voting-control than economic ownership. Thus, we distinguish between voting-ownership and economic ownership: (1) family control concerns owners who are actively engaged in the board or management and own above 20% of voting-rights, while (2) family ownership concerns owners who are actively engaged in board or management but own above 20% of the economic rights, which is in line with (Anderson and Reeb, 2003).

2.1.2 Agency cost resolution and stewardship theory

Demsetz and Lehn (1985) mention in their study the immense concentration of family welfare, as a percentage of total financial wealth, that families' investment often constitutes in the invested firm. According to the authors, this leads to strong reasons to reduce agency conflicts in order to preserve wealth, and serves as a way to reduce alignment related issues as well as excessive risk-taking. Furthermore, the lower risk-taking allows mitigation of agency cost of debt, and family firms are found to have a 32 basis-point lower cost of debt than non-family firms. In contrast, this relationship exhibits an inverted U-shape as the lowest cost of debt is shown for firms with <12% family ownership, and for >12%, the cost of debt is reduced by 22 basis-points instead of 32. The relationship is negatively impacted by a descendant CEO, where the cost of debt actually increases by 20 basis points, and is not affected by the founder as CEO. Also, other types of blockholding owners, mainly institutional, do not have an effect on cost of debt, showcasing the strength of long-term strategic focus, ownership alignment and devotion has on the cost of debt (Anderson, Mansi and Reeb, 2003). Apart from agency theory, scholars often cite stewardship theory as an explanatory variable for family ownership's positive effect on firm performance (Anderson, Mansi and Reeb, 2003; Lwango, Coeurderoy and Roche, 2017). The idea ties into that of agency theory, but it assumes that owners will act in a value-maximizing manner if they serve as stewards for the company. This observation is especially prominent in founding-family firms, where the founder holds an active role in the company, or utilizes activism to influence strategic direction, but it also concerns active non-founding family owners as their ownership is affected by the same value-maximizing end goal. It also helps reconcile the idea of agency cost of debt, and explains the reason why family ownership and family control leadership lowers cost of debt (Anderson, Mansi and Reeb, 2003; Lwango, Coeurderoy and Roche, 2017).

2.1.3 Long-term strategic vision

Anderson and Reeb (2003) note that family owners adopt a long-term holding mindset which helps them rationalize and prioritize long-term value creation rather than short-term profitability. This strategic vision fosters prudent investment choices, strong commitment to corporate

reputation, and resilience during economic downturns. The thought of value-maximization is backed by Casson (1999) and Chami (2001) who argue that family-ownership stakes are assets intended to be passed down in generations, and thus investments and ownership/control should promote long-term growth. James (1999) concurs with this conclusion, and notes that this notion of succession provides families incentives to invest in accordance to the market rule, that is, in NPV (Net Present Value).

2.1.4 Reputation

Anderson and Reeb (2003) argue that founding family and non-founding family firms are highly linked to the reputation of the family, and vice versa, which is due to the publicity often surrounding powerful families and the association of the company to family-name. This creates a self-fulfilling prophecy as the family's personal brand is contingent on firm success, which reinforces incentives to create both economic and social value to uphold family reputation. The result of reputational benefits are of course also a larger web of business contacts, investors, and suppliers, and potentially advantageous terms in equity and debt funding (Anderson and Reeb, 2003).

2.2 Negative effect of Family Control and Ownership

2.2.1 Using company to extract private benefit

The first potential threat regarding having a strong family owner, is the risk of excessive over-pursuance of self-interests rather than the interest of the company, its minority shareholders, and stakeholders (Fama and Jensen, 1985; Anderson and Reeb, 2003). As discussed before, financial success of the company and family are often highly intertwined, but if families are motivated by other definitions of success, such as social or environmental success, they might destroy firm value due to forgoing NPV positive projects, or investing in NPV-negative projects. Additionally, newer family generations might not take interest in developing and nurturing family legacy, and might consequently deprive the company of future value through excessive dividend outlay. There are numerous instances where families have acted in their self-interest through for example special dividends instead of investing in the future (Anderson and Reeb, 2003), which adversely affects companies' profitability and market position. It could also adversely affect their relationship to employees through lower cohesion and less willingness to work hard (Burkart, Gromb and Panunzi, 1997). Results hence show that there is a need for non-family presence on boards and in management teams in order to mitigate the negative family ownership side effects of family complexity (González-Cruz and Cruz-Ros, 2016).

2.2.2 Lower R&D investments

Li and Ryan Jr. (2022) observe a significantly negative effect between total investment (R&D + Capex) and family ownership, primarily derived from a negative relationship between family

ownership and R&D investments. More specifically, a 1% decrease in family ownership results in a 23-basis point increase in R&D. The authors relate this to Anderson, Mansi and Reeb (2003) as they suggest that excessive risk aversion leads to lower R&D investments, which in turn is because of the asymmetric wealth concentration that the equity stake in the company represents for the family's private placements. In other words, families forgo undertaking investments in order to limit the risk of their personal capital tied to the valuation and performance of the stock. Additionally, dilution fears limit cheap financing because families are often reluctant to dilute their shareholding to obtain capital, which consequently adversely affects R&D and investments. In other words, family-owned firms reject share issuances and subsequently risk failing to invest sufficiently in NPV positive projects. Thus, investment is more dependent on internal cash flow generation, and debt issuance, which in many cases can be expensive for small firms (Li and Ryan Jr., 2022). Obviously, this problematization of equity issuance is more nuanced, and creates a conflicting problem: not issuing equity risks depressing R&D investments which will hurt growth prospects and innovation, while issuing equity dilutes family control and invites other large blockholders to take control, which risks creating collusion between the large holders (Reddy and Wellalage, 2023).

However, there are overwhelmingly strong arguments supporting the notion that family ownership and control affects performance positively, and hence we formulate the following hypothesis:

H1: There is a positive relationship between family control and firm performance.

2.3 Active Ownership, Size, and Age

Similarly to many of the aforementioned studies, Lwango, Coeurderoy and Roche (2017) finds a positive relationship between family ownership and accounting-based performance (ROA) while specifically observing U.S Small and Medium sized Enterprises. Additionally, Lwango, Coeurderoy and Roche (2017) find that accounting-based performance is strengthened by active family ownership, i.e., active managerial influence, or active board involvement. The study references Miller and Breton-Miller (2005) who found a significantly positive effect of family CEO's involvement on performance when firms are small and family-owned through exploring the managerial involvement in day-to-day operations. In general, Lwango, Coeurderoy and Roche (2017) reference Uhlaner (2006) in saying that as ownership percentage of workers increase, i.e., there is a higher proportion of owners in employee, or board seats, the loyalty and sense of belonging increases in the company. This loyalty is said to be able to bring additional revenue while bypassing extra costs. Furthermore, the idea of involvement links to previously mentioned arguments surrounding neutralization of agency costs, which theoretically improves performance.

Does Size and Age matter?

A rational conclusion is consequently that as the company becomes bigger and older, and subsequently adds new family managers through generational shifts, the cohesion and involvement increases performance. Regarding size there is, for obvious reasons, a positive relationship between size and performance, however, there also exists an inverted U-shape relationship between active family members in top management positions (Chirico and Bau', 2014). Thus, there is a growingly positive effect on performance as the number of managers increase from zero to a few, and a declining positive effect on performance as the amount of family members in management go from a few to many. Furthermore, there also exists an inverted U-shape relationship between performance and high and low ownership/control level, which is positively moderated by a family CEO. This is significant, as it provides background to the complexity problem by explaining that firms with medium family ownership outperform those with low ownership, but as ownership stake rises to high (from moderate) the positive performance decreases again due to complexity problems and the tendency and risk of families using the company to extract private benefits (Reddy and Wellalage, 2023). This partly helps reconcile the differences between ownership and control as it is comparatively easier to gain and retain high control of voting rights by issuing dual-class shares in comparison to holding and retaining a similarly high ownership stake of total shares. This also brings more nuance to the previous discussion regarding external capital, dilution, and R&D investments (external blockholding is fine up to a certain point, whereafter it becomes harmful), and the reasons for this occurrence, among others, are also rationally explained by arguments made above surrounding collusion and diversity (Reddy and Wellalage, 2023). Moreover and importantly, Lwango, Coeurderoy and Roche (2017) found that family ownership and control's positive effect is negatively moderated by size and age. The theoretical reasoning behind this shift could be explained by the level of increased complexity with integrating personnel and owners with contrasting viewpoints, and consequently managing eventual problems associated with this (Davis and Harveston, 2001), which also explains the inverted U-shape regarding percentage of top management that family members constitute. Additionally, firm size introduces a bureaucratic rigidity and decreases entrepreneurial flexibility, which could diminish or dilute family owners' positive effect on performance (Chirico and Bau', 2014). To further examine the point, Lwango, Coeurderoy and Roche (2017) cite Birley (2001), Burkart, Gromb and Panunzi (1997), and Arregle *et al.* (2007), as they confirm that generational shifts are increasingly important as the firms become older, highlighting the problems of nepotism. This notion disfavors employee diversification and the natural sense of hiring based on experience and expertise, which could hurt the company's innovative direction. It could also make the company more rigid and promote 'business as usual' rather than innovative investments and change.

The complexity and collusion problems associated with greater firm size and age promote the following hypothesis:

H2: The relationship between family control and firm performance is negatively moderated by the size and age of the firm.

3. Sample & Data Collection

3.1 Sample & Data Cleaning

The dataset comprises unbalanced panel data on firms listed on Nasdaq Stockholm between 2010 and 2023. The sample includes firms from the Small Cap (market capitalization below SEK 1.5 billion), Mid Cap (SEK 1.5–10 billion), and Large Cap (above SEK 10 billion) segments, in accordance with Nasdaq Stockholm’s official classifications (Gustafsson, 2018). Firms listed on Spotlight Stock Market, First North, Nordic Growth Market (NGM), and Nordic MTF are excluded, as these markets tend to include firms that are smaller, less liquid, or lack sufficient and reliable data coverage in Refinitiv Eikon, the data source used for extraction of financial data.

Data cleaning involved the removal of firms with missing values in performance or control variables. This commonly affected secondary-listed companies (i.e., firms primarily listed on foreign exchanges), recent IPOs, and very young firms for which return or accounting metrics could not be reliably calculated. In particular, firms with less than five years of available stock return data were excluded, as the limited time window is considered insufficient for robust performance analysis. Additionally, each company with dual-class share structures, represented by A-class and B-class shares, appeared multiple times as separate entities based on the number of separate share-listings, in the data from Refinitiv Eikon. In other words, the dataset contained duplicates, with identical data except for the share price which reflected the specific share class. To avoid duplication, we retained only one entry per company, favoring the share class with higher liquidity.

Furthermore, ownership data was manually collected through Modular Finance’s Holdings ownership platform which provides comprehensive historical data on the ownership structures of all firms listed on Nasdaq Stockholm. It showcases ownership progression, change, and the nature of the ownership, hence, if the owner is managerially involved, a passive owner, or involved with the board. While Holdings updates its database regularly, the data used in this study is from the years 2010 to 2023. In addition, industry classification for each company in the sample, used to control for industry differences in the analysis, was also retrieved from Holdings.

Finally, to determine firm age, the founding year of each company was manually collected from official company websites, as no available database provided consistently reliable data on incorporation dates. The final sample, after collecting and cleaning the data, consists of 284 firms, of which 76 were classified as family-controlled.

3.2 Ownership Limitation & Clarification

We adopt a novel definition of family control, building on the framework of Faccio and Lang's (2002), by identifying family-controlled firms as those in which a family holds more than 20% of the voting rights and maintains active involvement in the board or executive management.

Based on this definition, the following criteria must be fulfilled for a company to be classified as family-controlled:

1. A family company is defined as a holding company owned by an individual, group of individuals, trust, or corporation/firm who all constitute a family, or have close ties to a family.
2. The family must control at least 20% of voting rights at the beginning of the time period or when the company was listed.
3. The same family must control above 20% of the voting rights at the end of the time period, that is, end of 2023, and the time frame of which there is data must equal or exceed five years. Hence, the family must continuously hold 20% of the voting rights throughout the allotted time period.
4. A Family member/representative must hold an insider role, meaning they must be actively engaged in the company's governance, either through management, or through the board of directors. This parameter successfully captures and ensures that the family has direct managerial influence.

Several listed holding companies in Sweden, such as Investor AB (owned by Wallenberg family), L E Lundbergföretagen AB (owned by Lundberg family), and Investment AB Latour (owned by Douglas family), are partly family-owned and hold significant stakes in portfolio companies where the family remains actively engaged. These holdings follow a pyramidal structure, where family control is exerted indirectly through ownership layers. Following Faccio and Lang (2002), we calculate effective family control by multiplying ownership percentages across tiers. For example, if a family owns 20% of a holding company, which in turn owns 20% of a portfolio firm, the effective control is 4%. However, since this indirect structure may imply passive family involvement, we only classify a portfolio company as family-controlled if a family member sits on its board. This excludes cases where only non-family executives represent the holding company. The definition also extends to foundations irrevocably linked to a family, such as the Knut and Alice Wallenberg Foundation, which controls 42.96% of Investor AB's voting rights. While Investor is considered family-controlled, its portfolio firm ABB Ltd, in which Investor holds 14.10% of voting rights, results in just 6.02% indirect control, below our 20% threshold. By contrast, Holmen AB qualifies as family-controlled, as the Lundberg family indirectly holds 57.36% of its voting rights through L E Lundbergföretagen ($92.2\% \times 62.21\%$), meeting both the control and engagement criteria (all percentages calculated based on 31st December 2023, and taken from Holdings (no date)).

Does Size and Age matter?

The study specifically observes and notes companies based on the largest owning entity. In cases where ownership is distributed among families, such as L E Lundbergföretagen, where one member owns roughly 82% of voting-rights, and two other family members each own roughly 5% respectively, the effective voting-ownership is counted as 92%. Additionally, if there is a company where a family's voting-ownership exceeds 20%, but an identified non-family shareholder exceeds the family's voting-stake, the company is not deemed to be family-controlled as we focus primarily on the largest individual owner(s).

Table 1

Industry Distribution of the Sample

This table presents the distribution of firms in the sample across different industry sectors, classified by family control status. The sample consists of 284 firms, divided into Family-Controlled (Family) and Non-Family-Controlled (Non-Family) categories. *Family-Controlled Firms* are defined as firms where the same family entity (a family or individual) holds at least 20 percent of the voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023) and has at least one representative actively involved in the firm's management or board. *Non-Family-Controlled Firms* include all other firms. The table reports the number of firms in each category, the total number of firms per industry, and the percentage share of family-controlled firms within each industry. Industries are classified based on categories provided by Holdings.

INDUSTRY	Non-Family	Family	Family (%)	Total Firms
Discretionaries	12	3	20.00	15
Energy & Environment	3	1	25.00	4
Finance	16	9	36.00	25
Health care	43	10	18.87	53
Industry	44	20	31.25	64
Information technology	26	2	7.14	28
Materials	2	5	71.43	7
Raw materials	6	0	0.00	6
Real estate	15	11	42.31	26
Services	18	8	30.77	26
Telecom & Media	2	0	0.00	2
Trading & Goods	21	7	25.00	28
Total	208	76	26.76	284

[Table 1](#) displays the distribution of family-controlled, non-family-controlled and total firms across different industry sectors in the sample. Family-controlled firms are present across nearly all categories, but their prevalence varies considerably by industry. The highest concentration of family-controlled firms is found in Materials (71.43%) and Real Estate (42.31%), while

industries such as Information Technology, Telecom & Media, and Raw materials have very low or no family firm representation. Overall, family-controlled firms account for 26.76% of the full sample of 284 firms. As mentioned, industry classifications are collected from Holdings, which does not disclose how the different industry categories are defined (*Holdings*, no date).

Table 2
Summary Statistics - Full Sample

This table presents summary statistics for all the continuous variables used in the regression analysis, based on the full sample. *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Tobin's Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Stock Return* is defined as the annual percentage change in stock price, including dividends. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. *Ln(Market Cap)* and *Ln(Total Assets)* are the natural logarithms of market capitalization and total assets (both in million SEK). *Ln(Age)* is the natural logarithm of firm age, calculated as the number of years since incorporation. The table reports the mean, median, standard deviation, minimum, and maximum values for each variable.

Variable	Mean	Median	St. Dev.	Min.	Max.
ROA (%)	2.11	5.64	22.64	-230.79	358.88
ROE (%)	1.13	12.02	145.61	-7275.90	451.12
Tobin's Q	1.93	1.12	2.49	0.06	35.05
Stock Return (%)	21.88	10.15	107.04	-96.00	4401.25
Debt/Equity (%)	69.59	41.20	280.39	-11934.19	3484.39
ln(Market Cap)	8.07	7.98	2.02	2.23	13.12
ln(Total Assets)	8.15	7.95	2.31	1.31	15.71
ln(Age)	3.55	3.43	0.92	0.00	6.03

[Table 2](#) displays summary statistics for the variables used in the regression models. As seen, the first five variables (ROA, ROE, Tobin's Q, Stock Return, and Debt/Equity) exhibit substantial variability, with extreme minimum and maximum values. This suggests the presence of outliers that could disproportionately influence the regression results or even violate key assumptions of OLS. To mitigate the impact of these extreme observations while retaining most of the data structure, we apply winsorization at the 1st and 99th percentiles for these five variables prior to the regression analysis, described in Section 4 (Methodology). An updated summary statistics table after winsorization is provided in the Appendix ([Table 10](#)), showing more reasonable ranges for these variables.

In contrast, winsorization was not applied to the log-transformed variables *ln(Market Cap)*, *ln(Total Assets)*, and *ln(Age)*. These variables are already compressed through the logarithmic transformation, naturally reducing the impact of skewed distributions and extreme outlier values. Additionally, the summary statistics for these variables show relatively modest variability,

suggesting that outliers are not as concerning for these variables. Therefore, winsorization of the log-transformed variables was deemed unnecessary and would simply risk removing potentially valuable variation. A correlation matrix of all variables included in the analysis is presented in the Appendix ([Table 11](#)).

4. Methodology

4.1 Overview

This study employs a quantitative research methodology, drawing from Anderson and Reeb (2003) and partially by Lwango, Coeurderoy and Roche (2017). In the analysis, Ordinary Least Squares (OLS) regression models are used to investigate the relationship between family control and firm performance, based on the panel dataset of Swedish listed firms. Firm performance indicators include both accounting-based and market-based measures. All regression models include industry and year fixed effects to mitigate potential omitted variable bias arising from unobserved, time-invariant, industry-specific factors, and time-specific macroeconomic influences.

4.2 Measures of Firm Performance

Return on assets (ROA) is our main measure of accounting-based performance, and as a complement we also use return on equity (ROE). ROA is defined based on net income divided by total assets, both in million SEK, and ROE is defined based on net income divided by shareholders' common equity, also in million SEK. We primarily use ROA due to its high adaptability and accuracy in assessing firm profitability, and its prevalence in previous literature (Anderson and Reeb, 2003; Villalonga and Amit, 2006; Lwango, Coeurderoy and Roche, 2017; Reddy and Wellalage, 2023).

Regarding market-based performance, our main measure is Tobin's Q, and our complimentary measure is annual Stock Return. Due to inherent difficulties in estimating the replacement value of assets for the definition of Tobin's Q as used by Anderson and Reeb (2003), we estimate Tobin's Q using an approximated definition in line with Chung and Pruitt (2007): market capitalization plus total interest-bearing debt, both in million SEK, divided by total assets in million SEK. Stock Return is defined as the percentage change in stock price from one year to another adjusted for the dividend per share, that is, closing stock price plus dividend per share divided by opening stock price on a yearly basis. We use stock return to measure and verify stock performance and Tobin's Q due to its accurate depiction of market valuation in relation to book value, reflecting market expectations of the firm's future performance, and due to its high usage in previous literature (Anderson and Reeb, 2003; Villalonga and Amit, 2006; Reddy and Wellalage, 2023).

4.3 Model Specifications

Two different types of OLS model specifications are employed to test our two hypotheses. The *Baseline Model* specification is used to estimate the direct effect of family control on firm performance, while controlling for firm size, firm age as well as leverage. The *Baseline Model* specification is formulated as:

$$\text{Firm Performance}_{it} = \beta_0 + \beta_1(\text{Family Control})_i + \beta_2(\text{Firm Size})_{it} + \beta_3(\text{Firm Age})_{it} + \beta_4(\text{Debt/Equity})_{it} + \gamma_t + \delta_{\text{Industry}} + \epsilon_{it}$$

Where Firm Performance is the performance measure of interest (ROA, ROE, Tobin's Q or stock return). Family Control is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Firm Size is defined as the natural logarithm of market capitalization in million SEK ($\ln(\text{Market Cap})$), and Firm Age is the natural logarithm of firm age, calculated as the difference between the current year and the founding year. Debt/Equity is the debt-to-equity ratio in percent, which is used to control for leverage. The remaining three terms denote Year fixed effects (γ_t), Industry fixed effects (δ_{Industry}) and the error term (ϵ_{it}).

To explore whether the relationship between Family Control and Firm Performance is moderated by Firm Size and/or Firm Age, we estimate interaction models. These include interaction terms between Family Control and the mean-centered versions of Firm Size and Firm Age. The *Interaction Model* specification is formulated as:

$$\text{Firm Performance}_{it} = \beta_0 + \beta_1(\text{Family Control})_i + \beta_2(\text{Firm Size}_c)_{it} + \beta_3(\text{Firm Age}_c)_{it} + \beta_4(\text{Debt/Equity})_{it} + \beta_5((\text{Family Control})_i * (\text{Firm Size}_c)_{it}) + \beta_6((\text{Family Control})_i * (\text{Firm Age}_c)_{it}) + \gamma_t + \delta_{\text{Industry}} + \epsilon_{it}$$

Where Firm Size_c and Firm Age_c denote *mean-centered* versions of the Firm Size and Firm Age variables, and the remaining variables are defined just like in the baseline model specification above.

Mean-centering is applied to the continuous moderator variables, Firm Size and Firm Age, in all regressions that include interaction terms, in order to improve the interpretability of the coefficients, particularly the main effect of the Family Control variable. Centering is performed by subtracting the sample mean from each observation, which re-scales the variable to have a mean of zero while preserving its variance and distribution. As a result, the estimated coefficient on Family Control in the interaction models reflects its effect at the *average* level of Firm Size

and Firm Age, respectively. This allows for a more meaningful interpretation of the main effect in the presence of interaction terms (Dawson, 2014).

To address the issue of serial correlation and heteroskedasticity in the panel data, all regressions are estimated with robust standard errors clustered at the firm level. This adjustment accounts for potential non-independence of error terms within firms over time and ensures that statistical inference is not biased by within-firm correlation over time. This type of robust standard errors are widely utilized in financial research particularly in panel data settings (Petersen, 2009). Additionally, Variance Inflation Factor (VIF) tests were conducted for all main regressions to check for potential multicollinearity issues. All VIF values, displayed in [Table 13](#) (Appendix), were well below conventional thresholds (<10), indicating that multicollinearity is not a concern.

4.4 Alternative Control Thresholds

In comparison to the 20% threshold, Lwango, Coeurderoy and Roche (2017), uses a controlling ownership stake exceeding 50%. This is due to their sample observing much smaller unlisted companies have no more than 50 employees (only a portion of the sample have above 50 employees), meaning there will in many cases be multiple actors with above 20%. Consequently, there will be an observable problem with analyzing the effect that potentially many different families have on performance, creating the need to increase the threshold criterion to 50% to ensure this is the largest UBO (ultimate beneficial owner). Our sample, ranging from one billion SEK in market cap to around 800-900 billion SEK market cap has a wider disbursement of ownership where multiple owners who all fulfill the four criteria mentioned above are unlikely.

With that being said, the discussion concerning Reddy and Wellalage (2023)'s arguments surrounding Inverse U-shapes of different ownership-threshold- levels broadens the analysis and scope of the entire discussion. Thus, in order to account for this concept, we adopt complementary control thresholds of 10%, 30%, 40%, and 50%, which is used to run new regressions on the dependent variables to test for the presence of an inverse U-shape (Reddy and Wellalage, 2023), and thereby get a more nuanced understanding of the effect of family control.

4.5 Limitations

The first limitation of this study concerns problems surrounding the definition of family-controlled firms, as it is in many cases difficult to determine the nature or origin of some ownership actors (Villalonga and Amit, 2006). Using Modular Finance's Holdings service we extract the name of the owners of the company, either a person or organisation of any sort, and thereafter, determine if the owner is a family or not. This classification is done based on official company filings on Allabolag (Allabolag – Nyckeltal, Resultatredovisning och Befattningar för svenska företag, no date), but also through Bolagsfakta (Bolagsfakta – Sveriges nya företagssök, no date) who disclose beneficial ownership on a percentage basis. The latter makes family

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classification for the majority of companies unproblematic, however some companies do not have data regarding the beneficial owner on Bolagsfakta. In these cases, the company is excluded from our sample as we can not verify the ownership structure. This problem extends to foundations, whom per definition do not have an UBO, and instead more research must be conducted to decide the origin of the managing parties. Additionally, as all family-data is extracted manually it is susceptible to possible human mistakes that could distort the data. While Refinitiv Eikon is a reputable source of financial data, certain limitations remain. Notably, gaps in the data implied that a considerable number of observations had to be dropped during the data cleaning and preparation process in order to ensure consistency and reliability in the analysis. Furthermore, determining the age of each firm poses challenges due to differing incorporation definitions. For example, Epiroc AB, the former mining division of Atlas Copco AB who was subsequently spun off in 2018, was formally recorded as a separate economic entity right after its spin-off, but has existed since the inception of Atlas (currently known as Atlas Copco AB) in 1873 (Epiroc, no date). When such discrepancies arose, the earlier date was typically selected as the founding year, as it more accurately reflects the firm's origin.. Problems in defining the founding year could create biases in the Firm Age variable which distorts regression results, and consequently affects validity of the results in the interaction model.

Additionally, there is risk that our results suffer from omitted variable bias, where the dependent variable is affected by other variables rather than the independent variable. Examples of this are more extensive regressions on insider ownership for family CEOs, which connects to stewardship theory and is heavily used in previous literature (Anderson and Reeb, 2003; Reddy and Wellalage, 2023). We partly explore this notion in our study, but not as thoroughly as previously mentioned studies. Another limitation is the potential influence of other blockholder on results and management decisions, however, this relationship is not the focal point of this study and is hence not emphasized.

Another key limitation relates to the underlying cause for increased performance. What we mean by this is that there is a significant risk of reverse causality; if performance is high, insiders may sell, or it might attract newer more diverse shareholders. Similarly, family owners might tend to favor well performing companies, explaining the increased ROA observed in family controlled companies. Demsetz and Villalonga (2001) argue that ownership structure is not randomly assigned, nor is it an external variable forced upon firms. Instead, it should be endogenously determined, meaning it arises from the deliberate decisions of firm insiders and shareholders in response to internal and external firm-specific factors. For example, Demsetz and Villalonga (2001) argue that company A with three shareholders each owning 30%, versus Company B with 30 owners each holding 3% of the shares, will not necessarily perform better as the ownership structure of the two companies are suited and determined based on the observed market characteristics for that specific company. Once, and that's if, the endogenous link is established between ownership and performance, there is no significant relationship pointing to higher

performance from family control. In response, we refer to Anderson and Reeb (2003) when arguing that this indicates an extreme level of foresight and proficiency in predicting future performance for the family firms, as the family firm age in our sample is on average 67 years old (See [Table 12](#) in Appendix). Additionally, it assumes that families are proficient equity investors, rather than firm-builders or entrepreneurs, and it assumes that families have an informational edge in relation to the market by knowing that exceptional performance is not already priced into the current price. However, Anderson and Reeb (2003) are not able to fully neglect the endogeneity problem because they fail to demonstrate that families are not less likely to exit firms in times of poor performance, and thus, risk of the reverse causality remains.

5. Results & Robustness

5.1 Main Results

This section presents the main empirical findings of the study. It begins by analyzing the relationship between family control and firm performance using accounting-based metrics (ROA and ROE), followed by market-based metrics (Tobin's Q and Stock Return). Both [baseline](#) and [interaction](#) models are used to assess whether the effects of family control vary systematically with firm size and age.

The regression results, presented in [Tables 3](#) and [4](#), offer mixed but insightful evidence regarding the relationship between Family Control and firm performance. When performance is measured using accounting-based indicators (ROA and ROE), family-controlled firms demonstrate a consistently positive and statistically significant performance advantage. These effects are not only robust across specifications but also economically meaningful in magnitude. Additionally, interaction models reveal that the positive impact of Family Control diminishes with increasing Firm Size and Firm Age, suggesting that the benefits of family influence are strongest in smaller and younger firms. These findings support both [H1](#) and [H2](#).

In contrast, when market-based performance measures are considered (Tobin's Q and Stock Return), the results are less consistent. There is no significant association between Family Control and Tobin's Q in any specification, and positive but relatively weakly significant for Stock Return in the interaction model only. Importantly, the interaction between Family Control and Firm Size is negative and strongly significant in the Stock Return interaction model, which aligns with the earlier finding that the positive effects of Family Control are more pronounced in smaller firms. In other words, the results on market-based performance are mixed and therefore do not provide strong support for either [H1](#) or [H2](#). These results suggest that while Family Control may enhance internal performance outcomes, the market does not consistently reward family involvement, particularly in larger and more mature firms.

Table 3
Family Control & Accounting-based Performance

This table reports results from OLS panel regressions with ROA and ROE as dependent variables. *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. *Ln(Market Cap)* is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. *Ln(Age)* is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. Interaction terms between Family Control and firm size (*Ln(Market Cap)*) and firm age (*Ln(Age)*) are included in Models (2) and (4). In these models, *Ln(Market Cap)* and *Ln(Age)* are mean-centered to improve interpretability. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA		ROE	
	(1)	(2)	(3)	(4)
Family Control	3.932** (0.003)	4.984*** (<0.001)	5.640** (0.006)	7.850*** (<0.001)
ln(Market Cap)	2.272*** (<0.001)	2.666*** (<0.001)	4.639*** (<0.001)	5.454*** (<0.001)
ln(Age)	0.832 (0.200)	1.435 (0.084)	1.020 (0.384)	2.311 (0.116)
Debt/Equity (%)	-0.017*** (<0.001)	-0.019*** (<0.001)	-0.045*** (<0.001)	-0.050*** (<0.001)
Family Control $\times$ ln(Market Cap)		-1.615** (0.003)		-3.312*** (<0.001)
Family Control $\times$ ln(Age)		-3.196* (0.017)		-6.758** (0.001)
Num.Obs.	3244	3244	3226	3226
R2 Adj.	0.262	0.274	0.262	0.279
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

[Table 3](#) displays the results from the [baseline](#) and [interaction](#) models on accounting-based performance, measured by ROA and ROE. Both baseline models show consistent evidence of a positive and statistically significant effect of Family Control on the performance variables.

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Model 1 suggests that family-controlled firms on average exhibit 3.93 percentage points higher ROA than non-family-controlled firms ($p = 0.003$), while Model 3 suggests that the corresponding figure is 5.64 percentage points in the case of ROE. These effects remain robust and even increase in the interaction models, where the Family Control coefficient increases to 4.98 for ROA (Model 2; $p < 0.001$) and to 7.85 for ROE (Model 4; $p < 0.001$).

The interaction between Family Control and Firm Size ($\ln(\text{Market Cap})$) is negative and statistically significant in both interaction models: -1.62 for ROA (Model 3; $p = 0.003$) and -3.31 for ROE (Model 4; $p < 0.001$). This suggests that the positive effect of Family Control diminishes as Firm Size increases, implying that Family Control may be more beneficial in smaller firms. Similarly, the interaction between Family Control and Firm Age ($\ln(\text{Age})$) is also negative and significant: -3.20 for ROA ($p = 0.017$) and -6.76 for ROE ($p = 0.001$). These results indicate that the performance benefits of Family Control are greater among younger firms, while they taper off in more mature organizations. Additionally, R-squared improves slightly in the interaction models compared to baseline models, indicating that the interaction terms add explanatory power.

Table 4

Family Control & Market-based Performance

This table reports results from OLS panel regressions with Tobin's Q and Stock Return as dependent variables. *Tobin's Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Stock Return* is defined as the annual percentage change in stock price, including dividends. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. Interaction terms between Family Control and firm size ($\ln(\text{Market Cap})$) and firm age ($\ln(\text{Age})$) are included in Models (2) and (4). In these models, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered to improve interpretability. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Tobin's Q		Stock Return	
	(1)	(2)	(3)	(4)
Family Control	-0.106 (0.557)	-0.093 (0.621)	2.451 (0.218)	3.983* (0.037)
$\ln(\text{Market Cap})$	0.236*** (<0.001)	0.276*** (<0.001)	5.112*** (<0.001)	6.697*** (<0.001)
$\ln(\text{Age})$	-0.445***	-0.488***	-7.594***	-8.609***

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	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Debt/Equity (%)	-0.002***	-0.002**	-0.027**	-0.029**
	(<0.001)	(0.001)	(0.002)	(0.001)
Family Control $\times$ ln(Market Cap)		-0.118		-5.041***
		(0.164)		(<0.001)
Family Control $\times$ ln(Age)		0.097		0.670
		(0.580)		(0.776)
Num.Obs.	3264	3264	2984	2984
R2 Adj.	0.226	0.228	0.256	0.261
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

[Table 4](#) presents the results from the [baseline](#) and [interaction](#) models on market-based performance, measured by Tobin's Q and Stock Return. For Tobin's Q, Models 1 and Model 2 reveal small and insignificant coefficients for Family Control (-0.106 and -0.093, respectively), indicating absence of a clear relationship between Family Control and Tobin's Q. For Stock Return, both models (3-4) report positive coefficients on Family Control at 2.45 (Model 3; $p = 0.218$) and 3.98 (Model 4; $p = 0.037$) respectively. However, only the coefficient in the interaction model is significant at the 5% level, suggesting a limited direct impact of Family Control on Stock Return.

As for the interaction terms, Model 2 indicates that neither Firm Size (ln(Market Cap)) nor Firm Age (ln(Age)) moderates the relationship between Family Control and Tobin's Q, as both interaction terms are statistically insignificant. On the other hand, in Model 4, the interaction term between Family Control and Firm Size is negative and significant (-5.04, $p < 0.001$). This suggests that Firm Size negatively moderates the effect of Family Control on Stock Return, and that any positive impact of the Family Control on stock performance is concentrated to smaller firms in the sample. However, similar to Model 3, the interaction between Family Control and Firm Age is statistically insignificant in Model 4, indicating absence of a moderating effect of Firm Age in this regard.

Across the eight regression models in both [Table 3](#) and [Table 4](#), the control variables generally follow consistent trends. Firm Size (ln(Market Cap)), has a positive and significant effect on the performance measures in all models. Firm Age (ln(Age)), is not significantly associated with either of the accounting-based performance measures ([Table 3](#)), but is negative and strongly significant ($p < 0.001$) across all market-based performance models ([Table 4](#)). Finally, the debt-to-equity ratio (Debt/Equity (%)) exhibits negative and significant coefficients across all

eight regression models, implying that leverage generally has a negative effect on both accounting- and market-based performance.

5.2 Robustness: Accounting-based Performance

This section reports the results from a series of robustness tests to validate the main findings related to accounting-based firm performance. Specifically, it tests the sensitivity of results to alternative definitions of Firm Size, varying thresholds for voting rights used to define Family Control, and the impact of active board or managerial involvement by family members.

The results from these robustness tests consistently support the main findings regarding Family Control and accounting-based performance. Whether testing alternative definitions of Firm Size ([Table 5](#)), varying the voting rights thresholds used to define Family Control ([Table 6](#), [Table 7](#)), isolating the role of active managerial/board involvement ([Table 8](#)), or estimating random effects models ([Table 15](#)), the positive association between Family Control and ROA/ROE remains robust. Moreover, the moderating effects of Firm Size and Firm Age generally persist across specifications, indicating further support for [H2](#). Together, these tests provide strong evidence that the main conclusions are not dependent on specific modeling choices, thereby reinforcing the robustness and credibility of the empirical results.

[Table 5](#) presents a robustness test in which Firm Size is proxied by $\ln(\text{Total Assets})$ instead of $\ln(\text{Market Cap})$, to examine whether the observed effects of Family Control on accounting-based performance are sensitive to how Firm Size is measured. The table replicates the [baseline](#) and [interaction](#) model structure used in [Table 3](#). Results remain qualitatively and statistically consistent with the original specifications in [Table 3](#). Family Control continues to be positively and significantly associated with both ROA and ROE in all four models, and the interaction terms again suggest that this positive effect diminishes with Firm Size ($\ln(\text{Total Assets})$) and Firm Age ($\ln(\text{Age})$). The interaction between Family Control and Firm Size is negative and significant for both ROA and ROE (Models 2 and 4), as is the interaction with Firm Age, though slightly less significant.

These results reinforce the findings from [Table 3](#) and the conclusions drawn in [Section 5.1](#), namely that Family Control is positively associated with accounting-based performance, and that this relationship is negatively moderated by Firm Size and Firm Age. Taken together, the results from [Table 3](#) and [Table 5](#) demonstrate that these conclusions are robust to alternative definitions of Firm size, whether measured by market capitalization or total assets.

Table 5

Family Control & Accounting-based Performance – Alternative Firm Size Definition

This table reports results from OLS panel regressions with ROA and ROE as dependent variables, using $\ln(\text{Total Assets})$ as an alternative proxy for firm size. *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. $\ln(\text{Total Assets})$ is the natural logarithm of total assets in million SEK and serves as an alternative firm size measure. $\ln(\text{Age})$ is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. Interaction terms between Family Control and firm size ($\ln(\text{Total Assets})$) and firm age ($\ln(\text{Age})$) are included in Models (2) and (4). In these models, $\ln(\text{Total Assets})$ and $\ln(\text{Age})$ are mean-centered to improve interpretability. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA		ROE	
	(1)	(2)	(3)	(4)
Family Control	3.866** (0.004)	5.333*** (<0.001)	5.483* (0.011)	8.428*** (<0.001)
$\ln(\text{Total Assets})$	2.375*** (<0.001)	2.967*** (<0.001)	5.247*** (<0.001)	6.395*** (<0.001)
$\ln(\text{Age})$	0.560 (0.413)	0.932 (0.288)	0.078 (0.949)	0.929 (0.537)
Debt/Equity (%)	-0.027*** (<0.001)	-0.031*** (<0.001)	-0.066*** (<0.001)	-0.075*** (<0.001)
Family Control $\times$ $\ln(\text{Total Assets})$		-2.570*** (<0.001)		-4.993*** (<0.001)
Family Control $\times$ $\ln(\text{Age})$		-2.470* (0.039)		-5.253** (0.006)
Num.Obs.	3244	3244	3226	3226
R2 Adj.	0.263	0.283	0.273	0.300
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Table 6

Family Control at different Voting Rights Thresholds & Accounting-based Performance (1)

This table reports results from OLS panel regressions with ROA as the dependent variable, using five different definitions of Family Control based on varying voting rights thresholds. *ROA* is return on assets in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. *Ln(Market Cap)* is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. *Ln(Age)* is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	2.050 (0.162)				
Family Control (20%)		3.932** (0.003)			
Family Control (30%)			3.182* (0.014)		
Family Control (40%)				3.088. (0.050)	
Family Control (50%)					2.252 (0.107)
ln(Market Cap)	2.251*** (<0.001)	2.272*** (<0.001)	2.249*** (<0.001)	2.285*** (<0.001)	2.298*** (<0.001)
ln(Age)	0.932 (0.144)	0.832 (0.200)	1.028 (0.110)	0.983 (0.129)	1.056 (0.102)
Debt/Equity (%)	-0.017*** (<0.001)	-0.017*** (<0.001)	-0.018*** (<0.001)	-0.018*** (<0.001)	-0.018*** (<0.001)
Num.Obs.	3244	3244	3244	3244	3244
R2 Adj.	0.257	0.262	0.258	0.257	0.255
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

[Table 6](#) presents the results of five different [baseline regressions](#) on ROA, using alternative definitions of the Family Control variable, based on varying thresholds of voting rights ownership ranging from 10% to 50%. The purpose of this robustness test is to assess whether the positive relationship between Family Control and accounting-based performance holds across different levels of control through voting rights.

The results indicate that Family Control is significantly and positively associated with ROA when defined at 20%, 30%, and 40% (weaker at 40%, $p = 0.050$) voting rights thresholds, with the strongest and most statistically significant effects observed at the 20% and 30% levels (Model 2; $p = 0.003$ and $p = 0.014$, respectively). This provides further support for [H1](#) and confirms that the conclusion regarding the direct effect of Family Control on accounting-based performance is robust to moderate adjustments in the Family Control definition. The main Family Control variable used in earlier models, based on a 20% threshold, thus appears to be a suitable and empirically supported specification.

Interestingly, the results also offer tentative support for an inverse U-shaped relationship between family control and performance, a pattern identified in prior literature (Reddy and Wellalage, 2023). Performance effects appear to rise with moderate levels of control (20–30%) but taper off or lose statistical significance at very low (10%) and high (50%) thresholds. This may reflect a balance between the alignment benefits of family involvement and the risks of entrenchment or reduced external oversight at higher ownership levels.

Finally, it is worth noting that the statistical significance of the Family Control coefficient naturally declines at higher thresholds, likely due to a reduction in the number of firms classified as family-controlled, leading to less variation and statistical power.

Table 7

Family Control at different Voting Rights Thresholds & Accounting-based Performance (2)

This table reports results from OLS panel regressions with ROA as the dependent variable, using five different definitions of Family Control and including interaction terms with firm size and firm age. *ROA* is return on assets in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. All models include interaction terms between Family Control and firm size ($\ln(\text{Market Cap})$) as well as Family Control and firm age ($\ln(\text{Age})$). In these models, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered to improve interpretability. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values

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are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	2.253 (0.141)				
Family Control (20%)		4.984*** (<0.001)			
Family Control (30%)			4.156** (0.003)		
Family Control (40%)				4.064. (0.055)	
Family Control (50%)					4.625** (0.007)
ln(Market Cap)	2.395*** (<0.001)	2.666*** (<0.001)	2.513*** (<0.001)	2.404*** (<0.001)	2.424*** (<0.001)
ln(Age)	2.127* (0.028)	1.435. (0.084)	1.295. (0.088)	1.080 (0.118)	1.110. (0.092)
Debt/Equity (%)	-0.020*** (<0.001)	-0.019*** (<0.001)	-0.019*** (<0.001)	-0.018*** (<0.001)	-0.019*** (<0.001)
Family Control $\times$ ln(Market Cap)	-0.433 (0.507)	-1.615** (0.003)	-1.435* (0.010)	-1.053. (0.089)	-1.379* (0.033)
Family Control $\times$ ln(Age)	-2.741* (0.047)	-3.196* (0.017)	-2.054 (0.130)	-1.478 (0.519)	-3.310. (0.093)
Num.Obs.	3244	3244	3244	3244	3244
R2 Adj.	0.261	0.274	0.264	0.258	0.257
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

[Table 7](#) follows the structure of [Table 6](#), and presents the results from five [interaction model](#) regressions on ROA using alternative voting rights thresholds to define Family Control, ranging from 10% to 50%. These models incorporate interaction terms between Family Control, and Firm Size and Firm Age respectively, to examine whether the moderating effects identified in [Table 3](#) and [Table 5](#) persists under different levels of control through voting rights.

The results for the main effect of Family Control generally align with the patterns observed in [Table 6](#). Statistically significant and positive effects are again observed at the 20%, 30%, and 40% (again weaker at 40%, $p = 0.055$) thresholds (Models 2-4). Interestingly, the 50% threshold, which previously was insignificant, now yields a significant and relatively large coefficient (4.63, $p = 0.007$), suggesting that performance gains persist even at high levels of Family Control in the presence of interaction terms. This result slightly deviates from the inverse U-shape pattern suggested earlier, though it may reflect interaction dynamics not captured in the simpler baseline models.

Turning to the interaction terms, all coefficients are negative across all five models, consistent with [H2](#). The interaction between Family Control and Firm Size is statistically significant in most of the models (most notably at the 20%, 30%, and 50% thresholds), reinforcing the conclusion that the positive effect of Family Control is strongest in smaller firms. For the interaction between Family Control and Firm Age, significance is concentrated at the lower thresholds (10% and 20%), while results become weaker and statistically insignificant at higher thresholds. This may indicate that younger firms benefit more clearly from family involvement, but that this moderating effect diminishes at higher ownership levels or becomes harder to detect due to reduced sample size.

In summary, the findings from [Table 7](#) confirm that the negative moderating effects of Firm Size, and to a slightly lesser extent Firm Age, remain largely robust across a range of voting rights thresholds for the Family Control definition. Taken together with the results from [Table 6](#), this provides relatively strong evidence that the main conclusions regarding the positive association between Family Control and accounting-based performance, as well as its moderation by Firm Size and Firm Age, are robust to these variations in how Family Control is defined.

Table 8

Family Control & Accounting-based Performance – The Impact of Active Managerial/Board Involvement

This table reports results from three OLS panel regressions with ROA as the dependent variable, comparing alternative specifications of Family Control and ownership. *ROA* is return on assets in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. *Family Ownership* is a broader binary indicator equal to 1 if the same family entity holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), regardless of involvement in board or management. *Active Involvement* is a binary indicator equal to 1 if a family-owned firm (Family Ownership = 1) includes at least one family representative in management or on the board. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. Models (1) and (2)

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are estimated on the full sample of firms, using Family Control and Family Ownership respectively as independent variables. Model (3) is restricted to family-owned firms (Family Ownership = 1) and includes Active Involvement as the key independent variable. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA		
	(1) Full Sample	(2) Full Sample	(3) Family Firms
Family Control	3.932** (0.003)		
Family Ownership		3.489* (0.011)	
Active Involvement			11.631. (0.097)
ln(Market Cap)	2.272*** (<0.001)	2.262*** (<0.001)	1.237** (0.002)
ln(Age)	0.832 (0.200)	0.884 (0.167)	-1.244. (0.094)
Debt/Equity (%)	-0.017*** (<0.001)	-0.017*** (<0.001)	-0.041*** (<0.001)
Num.Obs.	3244	3244	969
R2 Adj.	0.262	0.261	0.203
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

[Table 8](#) explores the role of active managerial or board involvement as a defining feature of Family Control by comparing three alternative regression specifications on ROA. Models 1 and Model 2 are [baseline regressions](#) estimated on the full sample. Model 1 uses the standard Family Control indicator, which requires both a minimum voting rights threshold of 20% and active family involvement in the firm's governance. Model 2 instead uses a broader Family Ownership variable, which only reflects the ownership of voting rights (the same 20% threshold) without requiring board or managerial participation from the family owner. Model 3 restricts the sample to family-owned firms (Family Ownership = 1) and includes a binary Active Involvement variable indicating whether the family owner is actively involved in management or on the board, or not (i.e., family-controlled vs. passively owned). *Note that ownership in this specific case refers to ownership of voting rights, NOT ownership of equity.* The regression model specification for Model 3 is displayed below:

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$$ROA_{it} = \beta_0 + \beta_1(\text{Active Involvement})_i + \beta_2(\text{Firm Size})_{it} + \beta_3(\text{Firm Age})_{it} + \beta_4(\text{Debt/Equity})_{it} + \gamma_t + \delta_{\text{Industry}} + \epsilon_{it}$$

(See Section [4.3](#) for detailed description of the variables)

The results in Models 1-2 indicate that both Family Control and Family Ownership are positively and significantly associated with ROA, although the effect of Family Control is slightly larger in magnitude (3.93 vs. 3.49 percentage points) and more statistically significant ($p = 0.003$ vs. $p = 0.011$). This suggests that both voting rights ownership and involvement matter, but that active participation may enhance the association between family influence and accounting-based firm performance.

Model 3, which compares active involvement vs. passive ownership (of voting rights) within family-owned firms, yields a large coefficient for Active Involvement (11.63) but lacks statistical significance ($p = 0.097$). The lack of significance is likely attributable to the very small number of family-owned firms without Active Involvement. As shown in [Table 14](#), only 7 out of 83 family-owned firms lack managerial or board representation by the family. This large imbalance in the different groups limits statistical power and increases uncertainty around the estimate. Still, the substantial coefficient magnitude suggests a potentially meaningful difference in performance, supporting the idea that active family governance may play an important role in driving performance benefits among family-owned firms.

As an additional robustness check, random effects (RE) regressions were estimated for the [baseline](#) and [interaction](#) models on accounting-based performance. These models, shown in [Table 15](#) and specified in section [8.2](#) (in Appendix), exclude industry and year fixed effects and instead include a firm-specific random intercept that captures unobserved heterogeneity across firms. The RE specification was tested to assess whether the main findings hold under an alternative model that is structurally different in terms of how it accounts for unobserved heterogeneity. Although the RE regressions resulted in lower explanatory power (adjusted r -squared) compared to the main specifications, the direction, magnitude, and significance of the key coefficients remain broadly consistent with earlier findings.

5.3 Robustness: Market-based Performance

This section reports the results of robustness tests for the main results concerning market-based performance measures in section [5.1](#). Specifically, it re-estimates the regression models excluding the years 2020–2023 to control for the severe macroeconomic shocks related to COVID-19 and Russia’s invasion of Ukraine, and tests the sensitivity of results to different voting rights thresholds used to define Family Control.

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The results confirm the general pattern observed in the main analysis. Family Control remains statistically insignificant in relation to Tobin's Q across all model specifications, while the association with Stock Return is positive and marginally significant only in interaction models at certain voting right thresholds. The negative and significant interaction between Family Control and Firm Size persists in the Stock Return models, indicating that any market-based performance premium from family involvement appears concentrated in smaller firms. Overall, the evidence suggests that the weak and inconsistent relationship persists even after accounting for macroeconomic shocks and alternative control definitions.

[Table 9](#) presents a robustness test for the market-based performance models initially presented in [Table 4](#), by re-estimating both [baseline](#) and [interaction](#) regressions on Tobin's Q and Stock Return using a more limited part of the sample that excludes the years 2020 to 2023. The purpose of this exclusion is to avoid the macroeconomic market anomalies, caused by the Covid-19 pandemic and Russia's invasion of Ukraine, from potentially distorting the results of the models on market-based performance. The results are qualitatively consistent with the findings reported in [Table 4](#). Family Control remains statistically insignificant in both Tobin's Q models (Model 1-2), and only marginally significant in the Stock Return model with interactions (4.33, $p = 0.075$). The interaction term between Family Control and Firm Size in Model 4 also remains strongly negative and highly significant ($p < 0.001$), reinforcing the earlier conclusion that any positive influence of Family Control on Stock Return appears to be concentrated among smaller firms. Just like in [Table 4](#), interactions with Firm Age are statistically insignificant across all four models.

These findings suggest that the main conclusions from section [5.1](#) regarding market-based performance are robust to the exclusion of recent years characterized by extraordinary macroeconomic shocks. The evidence continues to point to a limited and inconsistent relationship between Family Control and market-based performance measures, with some evidence suggesting that effects may vary based on Firm Size.

As an additional robustness check, the voting rights threshold analysis conducted for ROA in section [5.2](#) was replicated for Tobin's Q and Stock Return, using both [baseline](#) and [interaction](#) model specifications. The results, presented in [Tables 16-19](#) (Appendix), show that the Family Control coefficient remains statistically insignificant across all Tobin's Q models, regardless of voting rights threshold or inclusion of interaction terms. For Stock Return, Family Control is likewise insignificant in all baseline models, but reaches marginal significance in the interaction models at the 20%, 30%, and 50% thresholds. However, given the overall inconsistency and lack of statistical robustness in the market-based performance results, these additional findings do not substantially change the study's main conclusions.

Table 9

Family Control & Market-based Performance, Excluding Years 2020–2023

This table reports results from OLS panel regressions with Tobin's Q and Stock Return as dependent variables, based on a restricted sample that excludes the years 2020 through 2023. *Tobin's Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Stock Return* is defined as the annual percentage change in stock price, including dividends. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. *Ln(Market Cap)* is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. *Ln(Age)* is the natural logarithm of the number of years since firm incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. Interaction terms between Family Control and firm size ($\ln(\text{Market Cap})$) and firm age ($\ln(\text{Age})$) are included in Models (2) and (4). In these models, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered to improve interpretability. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Tobin's Q		Stock Return	
	(1)	(2)	(3)	(4)
Family Control	-0.104 (0.579)	-0.121 (0.537)	2.757 (0.238)	4.326 (0.075)
$\ln(\text{Market Cap})$	0.215*** (<0.001)	0.251*** (<0.001)	4.783*** (<0.001)	6.457*** (<0.001)
$\ln(\text{Age})$	-0.454*** (<0.001)	-0.528*** (<0.001)	-6.878*** (<0.001)	-8.155*** (<0.001)
Debt/Equity (%)	-0.001** (0.009)	-0.001* (0.017)	-0.025* (0.011)	-0.028** (0.007)
Family Control $\times$ $\ln(\text{Market Cap})$		-0.086 (0.340)		-5.072*** (<0.001)
Family Control $\times$ $\ln(\text{Age})$		0.216 (0.214)		1.120 (0.711)
Num.Obs.	2129	2129	1849	1849
R2 Adj.	0.231	0.232	0.087	0.095
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

6. Discussion and Conclusion

6.1 Discussion

The findings of this study on accounting-based performance are consistent with prior literature. Most notably our findings are in line with Lwango, Coeurderoy and Roche (2017), who examine ROA among non-listed small firms in the US and find a positive relationship between family ownership and firm performance, where the effect of family ownership is negatively moderated by firm size and age.

Similarly, Anderson and Reeb (2003), using ROA and Tobin's Q on U.S. firms, report a positive impact of family ownership on both accounting- and market-based performance. In contrast to Anderson and Reeb (2003), this study finds an inconsistent and largely insignificant effect of family control on market-based performance measures. If anything, part of the results indicate that there may be a positive effect of family control on stock performance, but that this effect is significantly and negatively moderated by firm size. In other words, any positive effect of family control on stock performance appears limited to smaller firms in our sample. Villalonga and Amit (2006) distinguish between family ownership and family control and argue that control in excess of ownership, which is a risk associated with family control, can dilute performance benefits, particularly in market-based metrics such as Tobin's Q. While our insignificant market-based performance results do not confirm Villalonga and Amit's (2006) argument that control in excess of ownership leads to adverse performance outcomes, it also does not contradict it. In our sample, family control does not explicitly imply an ownership-control discrepancy (where owners misuse their disproportionately large vote-holding), but it does increase the likelihood of such misalignment. Therefore, the lack of significance may reflect underlying distortions, such as agency risks tied to excess control, which interfere with market-based valuations.

One interpretation and explanation for the inconsistent market-based results is that the regressions estimate average effects across all firms, masking heterogeneous effects. Differences in firm characteristics, other than those controlled for (size, age, leverage, industry), could neutralize the aggregate effect, leading to overall insignificant results in market-based measures. Another potential explanation for the diverging results is differences in the sample data, as this study is based on Swedish listed companies while the majority of previous studies are based on American companies. This may suggest geographic variation in the effects of family control and ownership, but such conclusions are beyond the scope of this study and cannot be verified with the current data. Additionally, this study examines a different time-period than previous studies, implying that stocks are susceptible to different external price-affecting events that could complicate comparisons of stock performance and market valuation.

The underlying interpretation of the results suggest that while family control may enhance internal performance outcomes, market participants do not uniformly value or reward family involvement. Normally, stronger accounting-based performance would be reflected in higher market valuations, such as a higher Tobin's Q or superior stock returns, but the regressions of this study cannot confirm this. In line with the conclusions discussed regarding Villalonga and Amit's (2006) result, this implies that investors may perceive family control itself as a governance-related risk, potentially discounting such firms due to concerns over misalignment, entrenchment, or excess control.

A likely explanation lies in the discrepancy between cash-flow rights and voting rights in dual-class share structures, which are prevalent in Sweden. For example, a family might hold 10% of cash-flow rights but control 20% of the voting rights. This misalignment introduces agency risks: families with excess control may pursue objectives that are not aligned with maximizing shareholder value.

As a result, investors may tend to evaluate family firms based on their cash-flow ownership, not their voting control. In the example above, investors may perceive the family's influence as equivalent to 10% ownership, not 20%, and thus assign a lower valuation premium. This aligns with the inverted U-shape relationship, observed in some previous studies on family ownership and partially in our results ([Table 7](#), [Table 8](#)), where firms with moderate family ownership (e.g., 20%) tend to outperform those with low (e.g. 10%) or very high (e.g. 50%) ownership levels. When control exceeds ownership stakes, it could reverse the typical benefits of family ownership (like reduced agency costs and stronger alignment of interests), and the lower level of perceived skin-in-the-game (financial alignment) might create trust issues for minority shareholders.

In summary, dual-class share structures and ownership-control discrepancies might explain why market-based performance measures do not reflect the accounting-based overperformance of family-controlled firms. Investors may discount the value of excess control, neutralizing any positive valuation effects from superior accounting-based performance.

6.2 Conclusion

This study set out to investigate the relationship between family control and firm performance in Swedish publicly listed companies, and how this relationship is moderated by firm size and age. By distinguishing between accounting-based performance metrics (ROA, ROE) and market-based performance metrics (Tobin's Q, Stock Return), this research provides a nuanced perspective on the role of family control in firm success.

The regression analyses reveal a positive and significant relationship between family control and accounting-based performance, supporting [H1](#) and consistent with Anderson and Reeb (2003). However, this positive effect diminishes as firms grow larger and older, confirming [H2](#). Findings

of both hypotheses are consistent with prior research (Lwango, Coeurderoy and Roche, 2017), suggesting that family involvement is most beneficial in smaller, younger firms, where agency costs are reduced and stewardship incentives are strongest.

In contrast, market-based performance metrics yield mixed and mostly insignificant results, indicating that investors do not assign a valuation premium to family-controlled firms, despite their superior accounting-based performance. This divergence highlights a discrepancy between internal accounting-based performance and external market perceptions, which is potentially driven by agency risks associated with ownership-control discrepancies. In Sweden's prevalent dual-class share structures, families often wield greater voting control than economic ownership, which investors may view as a governance risk, thereby discounting firm value. This conclusion supports (Villalonga and Amit, 2006) claim that control in excess of ownership affects family control's influence on performance adversely. However, as accounting-based performance is positively associated with family control, our results can not reliably verify (Villalonga and Amit, 2006)'s thesis, instead it only partially helps reconcile a possible explanation for the differing market-based performance results in comparison to Anderson and Reeb's (2003).

These findings underscore the complex dynamics of family control in public markets, particularly within Sweden's unique regulatory environment as it highlights the difference of family ownership and family control. While family control can enhance operational efficiency and financial outcomes, excessive control relative to ownership may undermine investor confidence, preventing these benefits from translating into higher market valuations.

Future research should further explore the heterogeneity within family firms, such as the distinction between founding families and non-founding families, and possible effects of the dual-class shares on these, or the role of active versus passive family involvement in the context of dual-class share ownership. Moreover, examining family control's interaction with other blockholders or institutional investors could provide deeper insights into how ownership structures shape firm performance. Finally, extending this research to other countries that possess similar legislative structures, or add a comparative component that observes the heterogeneity of family control and family ownership between different countries could test the robustness of these findings across different legal and economic contexts, and bring more light to the effect that legal regimes and jurisdictions have on firm's ability to create and nurture performance and ownership simultaneously.

In conclusion, while family control remains a potent force in shaping firm performance, its effects are contingent on firm characteristics and market perceptions. Striking the right balance between control and ownership appears critical, not only for maximizing firm outcomes but also for maintaining investor trust in public markets.

7. References

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8. Appendix

8.1 Additional Table Outputs

Table 10

Summary Statistics - Full Sample (After Winsorizing)

This table presents summary statistics for the continuous variables used in the regression analysis, based on the full sample after winsorizing. Winsorization is applied at the 1st and 99th percentiles for variables susceptible to extreme values, including ROA, ROE, Tobin’s Q, Stock Return, and the Debt/Equity (%). *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Tobin’s Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Stock Return* is defined as the annual percentage change in stock price, including dividends. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. *Ln(Market Cap)* and *Ln(Total Assets)* are the natural logarithms of market capitalization and total assets (both in million SEK). *Ln(Age)* is the natural logarithm of firm age, calculated as the number of years since incorporation. The table reports the mean, median, standard deviation, minimum, and maximum values for each variable.

Variable	Mean	Median	St. Dev.	Min.	Max.
ROA (%)	2.06	5.64	18.52	-83.10	40.80
ROE (%)	5.14	12.02	32.18	-155.74	63.29
Tobin's Q	2.16	1.43	2.16	0.57	13.88
Stock Return (%)	18.72	10.15	54.35	-72.63	255.93
Debt/Equity (%)	72.03	41.20	118.79	0.00	812.28
ln(Market Cap)	8.07	7.98	2.02	2.23	13.12
ln(Total Assets)	8.15	7.95	2.31	1.31	15.71
ln(Age)	3.55	3.43	0.92	0.00	6.03

Table 11

Correlation Matrix

This table presents the correlation matrix for the main variables used in the regression analysis, based on the full sample. Winsorization is applied at the 1st and 99th percentiles for variables susceptible to extreme values, including ROA, ROE, Tobin’s Q, Stock Return, and the Debt/Equity (%). *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Tobin’s Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Stock Return* is defined as the annual percentage change in stock price, including dividends. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. *Ln(Market Cap)* and *Ln(Total Assets)* are the natural logarithms of market capitalization and total assets (both in million SEK). *Ln(Age)* is the natural

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logarithm of firm age, calculated as the number of years since incorporation. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. All correlations are based on pairwise complete observations. The upper triangle is blanked out for clarity.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. ROA (%)	1.00								
2. ROE (%)	0.92	1.00							
3. Tobin's Q	-0.14	-0.15	1.00						
4. Stock Return (%)	0.19	0.20	0.25	1.00					
5. Debt/Equity (%)	-0.01	-0.07	-0.19	-0.07	1.00				
6. ln(Market Cap)	0.29	0.32	0.03	0.12	0.15	1.00			
7. ln(Total Assets)	0.32	0.34	-0.35	-0.01	0.40	0.87	1.00		
8. ln(Age)	0.26	0.25	-0.23	-0.05	0.16	0.44	0.50	1.00	
9. Family Control	0.17	0.16	-0.11	0.01	-0.02	0.11	0.14	0.20	1.00

Table 12

Average Firm Age Based on Most Recent Observation (2023)

This table presents the average firm age based on the most recent observation in the dataset, corresponding to the year 2023. Firm age is calculated as the number of years since incorporation. The sample is divided into three groups: All Firms, Family-Controlled Firms, and Non-Family-Controlled Firms. *Family-Controlled Firms* are defined as firms where the same ultimate owner is a family or individual who (i) holds voting rights exceeding 20 percent continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) is actively involved in the board or management. *Non-Family-Controlled Firms* include all other firms in the sample. Reported averages are rounded to the nearest integer.

Group	Average Age
All Firms	54
Family-Controlled Firms	67
Non-Family-Controlled Firms	49

Table 13

Variance Inflation Factors (VIF) Across Models

This table presents Variance Inflation Factor (VIF) values for the independent variables used in the [baseline regression models](#) in the main analysis, for each of the four performance measures: ROA, ROE, Tobin's Q, and Stock Return. VIF tests are conducted to assess the presence of multicollinearity among the explanatory variables.

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A VIF value above 10 is typically considered indicative of problematic multicollinearity. *ROA* and *ROE* are return on assets and return on equity in percent, both based on net income. *Tobin's Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets. *Stock Return* is the annual percentage change in stock price, including dividends. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. *Ln(Market Cap)* and *Ln(Age)* are the natural logarithms of market capitalization (in million SEK) and firm age (years since incorporation), respectively. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. ROA, ROE, Tobin's Q, Stock Return and Debt/Equity (%) are winsorized at the 1st and 99th percentiles.

Variable	ROA VIF	Tobin's Q VIF	ROE VIF	Stock Return VIF
Family Control	1.05	1.05	1.05	1.05
ln(Market Cap)	1.25	1.25	1.25	1.24
Debt/Equity (%)	1.04	1.04	1.04	1.04
ln(Age)	1.29	1.30	1.30	1.29

Table 14

Active Managerial/Board Involvement Among Family Firms

This table presents a breakdown of active managerial and board involvement among family-owned firms in the sample. A firm is classified as *family-owned* if the same family entity (a family or individual) holds at least 20 percent of the voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), regardless of whether the family is actively involved in governance. *Active Involvement* is defined as having at least one family representative serving in the firm's management or on its board continuously throughout the firm's observed listing period. The table shows the total number of family-owned firms, the number with and without active involvement, and the corresponding share of firms without involvement, expressed as a percentage.

Category	Value
Total Family-Owned Firms	83
With Active Involvement	76
Without Active Involvement	7
Share Without Involvement (%)	8.43

Table 15

Family Control & Accounting-based Performance - Random Effects Models

This table reports results from random effects panel regressions with ROA and ROE as dependent variables. *ROA* is return on assets in percent, based on net income. *ROE* is return on equity in percent, based on net income. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period

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(2010–2023), and (ii) has at least one representative actively involved in the firm’s management or board. If either condition is not met, Family Control is equal to 0. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for Firm Size. $\ln(\text{Age})$ is the natural logarithm of the number of years since firm incorporation. $\text{Debt/Equity (\%)}$ is the debt-to-equity ratio expressed in percent. Interaction terms between Family Control and Firm Size ($\ln(\text{Market Cap})$) and Firm Age ($\ln(\text{Age})$) are included in Models (2) and (4). In these models, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered to improve interpretability. All regressions are estimated with robust standard errors clustered at the firm level to correct for serial correlation and heteroskedasticity in the panel data. The random effects estimator is used instead of fixed effects, and no year or industry fixed effects are included. p-values are displayed in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	ROA		ROE	
	(1)	(2)	(3)	(4)
Family Control	6.134*** (<0.001)	7.109*** (<0.001)	9.487*** (<0.001)	11.740*** (<0.001)
$\ln(\text{Market Cap})$	2.429*** (<0.001)	2.907*** (<0.001)	4.654*** (<0.001)	5.645*** (<0.001)
$\ln(\text{Age})$	1.114 (0.354)	1.825 (0.221)	1.859 (0.311)	3.687 (0.102)
Debt/Equity (%)	-0.020*** (<0.001)	-0.021*** (<0.001)	-0.085*** (<0.001)	-0.086*** (<0.001)
Family Control $\times$ $\ln(\text{Market Cap})$		-2.209** (0.002)		-4.562*** (<0.001)
Family Control $\times$ $\ln(\text{Age})$		-3.857* (0.037)		-9.819** (0.002)
Num.Obs.	3244	3244	3226	3226
R2 Adj.	0.055	0.062	0.109	0.121
Industry Fixed Effects	No	No	No	No
Year Fixed Effects	No	No	No	No

Table 16

Family Control at different Voting Rights Thresholds & Tobin's Q (1)

This table reports results from OLS panel regressions with Tobin’s Q as the dependent variable, using five different definitions of Family Control based on varying voting rights thresholds. *Tobin’s Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the market values a firm relative to its book value. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm’s voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative

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actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of firm age, calculated as the number of years since incorporation. $\text{Debt/Equity (\%)}$ is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Tobin's Q				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	-0.283 (0.149)				
Family Control (20%)		-0.106 (0.557)			
Family Control (30%)			-0.237 (0.124)		
Family Control (40%)				-0.088 (0.610)	
Family Control (50%)					-0.002 (0.991)
$\ln(\text{Market Cap})$	0.240*** (<0.001)	0.236*** (<0.001)	0.238*** (<0.001)	0.236*** (<0.001)	0.236*** (<0.001)
$\ln(\text{Age})$	-0.423*** (<0.001)	-0.445*** (<0.001)	-0.444*** (<0.001)	-0.449*** (<0.001)	-0.453*** (<0.001)
Debt/Equity (%)	-0.002*** (<0.001)	-0.002*** (<0.001)	-0.002*** (<0.001)	-0.002*** (<0.001)	-0.002*** (<0.001)
Num.Obs.	3264	3264	3264	3264	3264
R2 Adj.	0.229	0.226	0.227	0.226	0.226
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

Table 17

Family Control at different Voting Rights Thresholds & Tobin's Q (2)

This table reports results from OLS panel regressions with Tobin's Q as the dependent variable, using five different definitions of Family Control and including interaction terms with firm size and firm age. *Tobin's Q* is calculated as the ratio of market capitalization plus total interest-bearing debt to total assets, and serves as a proxy for how the

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market values a firm relative to its book value. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm's voting rights continuously throughout the firm's observed listing period, and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. Interaction terms between Family Control and firm size ($\ln(\text{Market Cap})$) and firm age ($\ln(\text{Age})$) are included in all models. To improve interpretability, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered in all five models. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of firm age, calculated as the number of years since incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Tobin's Q				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	-0.275 (0.162)				
Family Control (20%)		-0.093 (0.621)			
Family Control (30%)			-0.241. (0.098)		
Family Control (40%)				-0.109 (0.533)	
Family Control (50%)					-0.201 (0.371)
$\ln(\text{Market Cap})$	0.340*** (<0.001)	0.276*** (<0.001)	0.259*** (<0.001)	0.235*** (<0.001)	0.235*** (<0.001)
$\ln(\text{Age})$	-0.525** (0.001)	-0.488*** (<0.001)	-0.484*** (<0.001)	-0.453*** (<0.001)	-0.464*** (<0.001)
Debt/Equity (%)	-0.002*** (<0.001)	-0.002** (0.001)	-0.002*** (<0.001)	-0.002*** (<0.001)	-0.002** (0.001)
Family Control $\times$ $\ln(\text{Market Cap})$	-0.199* (0.028)	-0.118 (0.164)	-0.080 (0.337)	0.011 (0.918)	0.025 (0.832)
Family Control $\times$ $\ln(\text{Age})$	0.184 (0.326)	0.097 (0.580)	0.162 (0.263)	0.047 (0.819)	0.354 (0.204)
Num.Obs.	3264	3264	3264	3264	3264
R2 Adj.	0.235	0.228	0.228	0.225	0.226
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes

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Year Fixed Effects Yes Yes Yes Yes Yes

Table 18

Family Control at different Voting Rights Thresholds & Stock Return (1)

This table reports results from OLS panel regressions with Stock Return as the dependent variable, using five different definitions of Family Control based on varying voting rights thresholds. Stock return is calculated as the annual percentage change in stock price, including dividends, and serves as a proxy for investor returns. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. *Ln(Market Cap)* is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. *Ln(Age)* is the natural logarithm of firm age, calculated as the number of years since incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Stock Return				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	3.132 (0.111)				
Family Control (20%)		2.451 (0.218)			
Family Control (30%)			2.252 (0.314)		
Family Control (40%)				2.957 (0.248)	
Family Control (50%)					4.382 (0.178)
ln(Market Cap)	5.069*** (<0.001)	5.112*** (<0.001)	5.095*** (<0.001)	5.122*** (<0.001)	5.149*** (<0.001)
ln(Age)	-7.738*** (<0.001)	-7.594*** (<0.001)	-7.480*** (<0.001)	-7.557*** (<0.001)	-7.580*** (<0.001)
Debt/Equity (%)	-0.026** (0.003)	-0.027** (0.002)	-0.027** (0.002)	-0.027** (0.002)	-0.027** (0.002)
Num.Obs.	2984	2984	2984	2984	2984

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R2 Adj.	0.256	0.256	0.255	0.255	0.256
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

Table 19

Family Control at different Voting Rights Thresholds & Stock Return (2)

This table reports results from OLS panel regressions with Stock Return as the dependent variable, using five different definitions of Family Control and including interaction terms with firm size and firm age. *Stock Return* is defined as the annual percentage change in stock price, including dividends, and serves as a proxy for investor returns. *Family Control* is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least a specified threshold of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Five different voting rights thresholds (10%, 20%, 30%, 40%, 50%) are applied in separate regressions to test the sensitivity of the results to varying definitions of control. Interaction terms between Family Control and firm size ($\ln(\text{Market Cap})$) and firm age ($\ln(\text{Age})$) are included in all models. To improve interpretability, $\ln(\text{Market Cap})$ and $\ln(\text{Age})$ are mean-centered in all five models. $\ln(\text{Market Cap})$ is the natural logarithm of market capitalization in million SEK and serves as a proxy for firm size. $\ln(\text{Age})$ is the natural logarithm of firm age, calculated as the number of years since incorporation. *Debt/Equity (%)* is the debt-to-equity ratio expressed in percent. All regressions include year and industry fixed effects, and robust standard errors clustered at the firm level. p-values are reported in parentheses beneath each coefficient. Significance levels: . $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	Stock Return				
	(1)	(2)	(3)	(4)	(5)
Family Control (10%)	3.606. (0.078)				
Family Control (20%)		3.983* (0.037)			
Family Control (30%)			3.991. (0.052)		
Family Control (40%)				3.909 (0.112)	
Family Control (50%)					4.803* (0.040)
$\ln(\text{Market Cap})$	7.010*** (<0.001)	6.697*** (<0.001)	6.212*** (<0.001)	5.692*** (<0.001)	5.621*** (<0.001)
$\ln(\text{Age})$	-8.873*** (<0.001)	-8.609*** (<0.001)	-8.468*** (<0.001)	-8.077*** (<0.001)	-7.893*** (<0.001)

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Debt/Equity (%)	-0.029** (0.002)	-0.029** (0.001)	-0.029** (0.001)	-0.028** (0.002)	-0.029** (0.001)
Family Control × ln(Market Cap)	-3.935** (0.003)	-5.041*** (<0.001)	-5.004*** (<0.001)	-3.754** (0.003)	-4.490** (0.002)
Family Control × ln(Age)	1.564 (0.503)	0.670 (0.776)	2.185 (0.353)	2.582 (0.380)	3.515 (0.257)
Num.Obs.	2984	2984	2984	2984	2984
R2 Adj.	0.260	0.261	0.259	0.257	0.257
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

8.2 Model Specifications for Random Effects Regressions

Baseline RE Model:

$$Firm\ Performance_{it} = \beta_0 + \beta_1(Family\ Control)_i + \beta_2(Firm\ Size)_{it} + \beta_3(Firm\ Age)_{it} + \beta_4(Debt/Equity)_{it} + \mu_i + \epsilon_{it}$$

Where Firm Performance is the performance measure of interest (ROA, ROE). Family Control is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. Firm Size is defined as the natural logarithm of market capitalization in million SEK (ln(Market Cap)), and Firm Age is the natural logarithm of firm age, which in turn was calculated as the current year minus the founding year. and Debt/Equity is the debt-to-equity ratio in percent, which is used to control for leverage. μ_i is the firm-specific random effect intercept and ϵ_{it} denote the error term.

Interaction RE Model:

$$Firm\ Performance_{it} = \beta_0 + \beta_1(Family\ Control)_i + \beta_2(Firm\ Size_c)_{it} + \beta_3(Firm\ Age_c)_{it} + \beta_4(Debt/Equity)_{it} + \beta_5((Family\ Control)_i * (Firm\ Size_c)_{it}) + \beta_6((Family\ Control)_i * (Firm\ Age_c)_{it}) + \mu_i + \epsilon_{it}$$

Where Firm Size_c and Firm Age_c denote *mean-centered* versions of the Firm Size and Firm Age variables, and the remaining variables are defined just like in the baseline RE model specification above.

8.3 Variable Definitions

Below follows a description of the variables used in the regression analysis, as well as underlying variables used to derive some of them (DPS and Stock Price).

Family Control: Family Control is a binary indicator equal to 1 if (i) the same family entity (a family or individual) holds at least 20% of the firm's voting rights continuously throughout the years the firm is listed during the observed time period (2010–2023), and (ii) has at least one representative actively involved in the firm's management or board. If either condition is not met, Family Control is equal to 0. For alternative definitions (used in Table 7 and Table 8), voting rights thresholds are set at 10%, 30%, 40%, and 50%.

Source: Holdings

Family Ownership: A dummy variable defined exactly just like Family Control (see above), but excluding the requirement that the family entity must have at least one representative in the board or management.

Source: Holdings (underlying data used for classification)

Active Involvement: A dummy variable used to distinguish between family-owned firms (Family Ownership = 1) with active managerial or board involvement, and family-owned firms without such active involvement.

Source: Holdings (underlying data used for classification)

Share Price: the exchange close price in SEK.

Source: Refinitiv Eikon

DPS: Annualized dividend per share in SEK.

Source: Refinitiv Eikon

ROA: Return on assets based on net income, in percent.

Source: Refinitiv Eikon

ROE: Return on equity based on net income, in percent.

Source: Refinitiv Eikon

Tobin's Q: Defined as (Market Cap in million SEK + total debt in million SEK)/ Total Assets in million SEK.

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Source: Refinitiv Eikon (Market Cap, Total Debt and Total Assets)

Stock Return: Annual stock return, calculated as $(\text{Stock Price}_t + \text{DPS}_t - \text{Stock Price}_{t-1}) / \text{Stock Price}_{t-1}$

Source: Refinitiv Eikon (Stock Price and DPS)

ln(Market Cap): The natural logarithm of Market Cap (in million SEK)

Source: Refinitiv Eikon (Market Cap)

ln(Age): The natural logarithm of years since the company's inception (for each observation: Year - Founding Year).

Source: Founding year was collected manually from each company's website.

ln(Total Assets): The natural logarithm of Total Assets (in million SEK)

Source: Refinitiv Eikon (Total Assets)

Industry: Industry category. Industries included are:

- Healthcare
- Real estate
- Discretionaries
- Information technology
- Industry
- Services
- Trading & goods
- Energy & Environment
- Finance
- Raw Materials
- Materials
- Telecom & Media

Source: Holdings (called "Sector" on Holdings)

Debt/Equity (%): Debt-to-equity ratio (Total Debt / Common Equity) in percent.

Source: Refinitiv Eikon

8.4 AI Disclosure

Chat GPT (4o) has been used in the writing of this thesis, especially for helping rewrite sentences, detangle vague formulations, and as a support function for grammatical errors. Anything and everything included within this study that has gone through the Ai is initially written by us, the authors, and not by the AI. Hence, the AI has solely been asked to rewrite

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previously written sentences to make sure the intended points and arguments are accentuated throughout the text.

Furthermore, AI (specifically Chat GPT (4o) and Gemini) has been used as a supporting tool throughout the programming/coding process in both Python and R.