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Esse non videri

Does sphere ownership influence the level of earnings management in Swedish firms?

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Abstract

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Key words: Sphere ownership, corporate ownership, earnings management, accrual-based earnings management

Purpose and research question: The purpose of this study is to investigate if earnings management is influenced by sphere control in a general sense, as well as by family sphere and non-family sphere control. We therefore ask the following research question: Does sphere ownership influence the level of earnings management in Swedish firms?

Methodology: We are addressing our research question empirically by estimating Pooled Ordinary Least Squares (POLS) and random effect regressions, using robust standard errors clustered by firm. The absolute values of discretionary accruals estimated with the Modified Jones Model are used as the dependent variable. Furthermore, the models control for variables found to have an effect on earnings management in empirical literature, as well as industry and year effects. The findings are furthermore subject to a battery of robustness checks.

Theoretical perspectives: The theoretical perspectives used to develop our hypothesis and contextualise our findings are agency theory - extended with the entrenchment and alignment effect, stewardship theory and socioemotional wealth theory.

Empirical foundation: The study uses a final sample of 1,704 firm-year observations of 243 firms listed on the Stockholm Stock Exchange (SSE Nasdaq OMX) over the time period 2010-2020.

Conclusions: We do not find sufficient evidence of controlling sphere ownership influencing the degree of earnings management in Swedish firms. However, we do find that family sphere-controlled firms are associated with lower levels of earnings management than other firms.

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Table of Contents

1. Introduction

1.1 Background

On June 18th of 2020, when the company announced that €1.9 billion were missing from its balance sheet, Financial Times investigative reporter Dan McCrum could after years of investigation finally declare that his speculations were correct. Wirecard[1], had indeed committed accounting fraud of biblical proportions (McCrum, 2020; Dagens industri, 2020). As the dust settled, the discussion concerning the importance of reliable financial reporting was once again making headlines globally, and in Sweden (Poutiainen & Wissén, 2021).

Sweden's history also contains a number of major accounting fraud revelations. Some notable examples in modern history are: Fermenta in 1984, Prosolivia in 1998, ABB in 2002 and Skandia in 2003. As a result of the two latter scandals, the Swedish government established a Commission on Business Confidence with the aim of improving business transparency and implementing policy changes. The commission concluded that poor corporate governance was a key factor and subsequently released the Swedish Code of Corporate Governance in 2005. The code is a self-regulated "comply or explain" rulebook that focuses heavily on transparency regarding remuneration programmes for managers (Jones, 2012; Kollegiet för svensk bolagsstyrning, 2005).

In Sweden, parallel to the earnings management discussion, some concerns revolving around large ownership spheres have emerged in recent years. In general, the Swedish corporate ownership structure, characterised by concentration, stability, a high level of active ownership and long-termism has been described as a success story (Agnblad et al. 2001; Milne, 2013). Proponents have further pointed out the social responsibility strong Swedish owners have had towards stakeholders and society in general (Doukas et al. 2002). However, in 2015 the Swedish model was called into

[1] Wirecard is an insolvent payment processing company based in Germany. The 2020 scandal is often described as Germany's largest post-war fraud scandal (Reuters, 2021).

question. During the autumn of 2014, Andreas Cervenka and Torbjörn Isacsson of Svenska Dagbladet published articles about the forest company Svenska Cellulosa AB (SCA). The articles revealed that the SCA leaders, such as Sverker Martin-Löf (former chairman of SCA and Industrivärden) and Jan Johansson (former CEO of SCA) had been flying in company aeroplanes and going on costly hunting trips with friends and family members, costing shareholders millions (Careborg, 2021). Both stepped down from their positions shortly after. The cross-ownership between Handelsbanken, Industrivärden and SCA was seen as particularly problematic and by 2016, these cross ownerships were dissolved (Martin-Löf, 2016). The Swedish Prosecution Authority later opened a "disloyalty to principal investigation" directed at Jan Johansson, for causing major costs for SCA (Hägerstedt, 2017a). A number of months later, the preliminary investigation was however dropped (Hägerstedt, 2017b).

In early 2022, Swedish ownership spheres were once again receiving bad publicity. This after Börje Ekholm, CEO of Ericsson, announced that the Swedish telecom company may have bribed the ISIS terror group after internal probes found payments for transportation routes made to avoid customs (Mothander, 2022). Ericsson is essentially controlled by the Wallenberg and Lundberg spheres, who together own 38.93 % of voting power with only 10.61 % of capital as of May 2022 (Holdings, 2022). When the Ericsson-scandal unravelled in 2022, concerns were raised by Christer Gardell, managing partner and co-founder of Cevian Capital. As the second largest Ericsson-owner in regards to equity with a 4,28 % stake, but the fourth largest owner in regards to voting power with 2.56% (Holdings, 2022), he heavily criticised the governance of Ericsson and the two mega-spheres. He is now calling for major reforms in the bi-laws by arguing for conversion clauses that can make A-shares into B-shares (Milne, 2022).

1.2 Problem and research question

For stakeholders to be able to make well informed decisions it is important that the financial reporting, on which investor decisions are based, is of high quality (Healy & Wahlen, 1999). High quality accounting is also one of the key ingredients in the development and efficient functioning of capital markets (Mhedbi & Zeghal, 2006). Because of the significance of quality reporting, on both

a micro and macro level, we view research on the determinants of accounting quality as particularly important.

There is a growing body of literature that links corporate ownership and reporting quality. Most studies use accrual-based earnings management as a proxy for poor reporting quality. Researchers have looked at family ownership (Martin et al. 2016; Tong, 2007; Achleitner et al. 2014; Chi et al. 2015; Ding et al. 2011; Wang, 2006), ownership concentration (Fan & Wong, 2002; Bao & Lewellyn, 2017), and institutional ownership (Garel et al. 2021; Koh, 2007). In general, monitoring capabilities, long-term investment horizons, strong minority shareholder protection and dispersed ownership seem to mitigate earnings management. Most of the research on earnings management has however been conducted in Anglo-Saxon corporate governance settings.

From a corporate ownership perspective, the Swedish setting is very distinct, and almost diametrically opposed to the commonly studied Anglo-Saxon setting (Agnblad et al, 2001). In Swedish companies, the ownership concentration is extremely high and large block holders use control mechanisms such as dual-class shares, pyramidal ownership and cross-holdings to retain control (Agnblad et al. 2001). Further, ownership spheres have had, (and still have) a dominant role in the Swedish corporate ecosystem. In 1997, the two largest spheres, The Wallenberg-sphere and the Handelsbanken-sphere together controlled 63.4 % of the Stockholm Stock Exchange (Henrekson & Jakobsson, 2008). In a report by the politically left leaning think tank Katalys, it was found that 15 families controlled 70 % of the Swedish Stock Exchange 20 years later, in 2017 (Allelin et al. 2018).

Whether Swedish firms with spheres as owners engage in more or less earnings management has, to the extent of our knowledge, never been researched. Theoretically, there is support for these firms engaging in both more and less earnings management. From an agency theory perspective, it can be argued that high concentration will lead to both minority expropriation (Shleifer and Vishny, 1997), and owner alignment (Wang, 2006). The relationship could also be looked at through the lens of stewardship theory, which suggests that opportunistic behaviour should be mitigated (Donaldson

& Davis, 1991; Davis et al. 1997). The similarities spheres have with families also suggests that socioemotional wealth theory is applicable (Gomez-Mejia et al. 2007). This theory suggests that firms controlled by spheres should be more tolerant of suboptimal performance, which decreases incentives for earnings management.

Considering the societal benefits of earnings management research, and the unexplored characteristics of the Swedish setting and ownership spheres, we wish to contribute to the literature by answering the following two research questions: **Does sphere ownership influence the level of earnings management in Swedish firms?**

1.3 Methodology and main findings

Our study uses a final sample of 1,704 firm-year observations of 243 firms listed on the Stockholm Stock Exchange (SSE Nasdaq OMX) over the time period 2010-2020. In order to assess the effect of sphere ownership on earnings management, this study will use a Pooled Ordinary Least Squares (POLS) regression model controlling for industry and year effects, followed by a random effects model to test our first hypothesis. The absolute values of discretionary accruals estimated with the Modified Jones Model (Jones, 1991; Dechow et al. 1995) are used as the dependent variable. After controlling for variables customary in earnings management-research, industry effects and year effects, we find that the main model does not provide us with sufficient evidence to establish an association between sphere ownership and levels of earnings management. To further explore the relationship between the two and test our second and third hypotheses, we categorise ownership spheres into family and non-family spheres. To examine if these subsamples are associated with higher or lower levels of EM, we estimate new regressions using the same methodology as for the first hypothesis. The results indicate that firms with family-spheres as the largest controlling owner are associated with lower levels of earnings management than other firms. To test the robustness of the significant results, we use a battery of robustness checks. Firstly, we re-estimate our regressions using different approaches to estimate earnings management. Secondly, we re-estimate our regressions using a different threshold for owners to be regarded as controlling. Thirdly, to deal with the potential problem of self-selection bias, we run a new regression on a matched sample using

Propensity Score Matching (PSM). We find that our results regarding family sphere control and earnings management are robust.

1.4 Contribution

Our study contributes to existing literature by providing a unique and specific angle to understanding the impact of ownership structure on earnings quality and earnings management. Various studies have previously investigated the relationship between ownership structure and earnings management, often through the lens of family ownership or institutional ownership. Most research on earnings management has been done in either the U.S. or in emerging markets, and we have found no studies considering the unique setting provided in Sweden. Characterised by highly concentrated ownership, an extensive use of dual-class shares, pyramidal structures and cross-holdings by ownership spheres, the Swedish market provides an interesting setting for research (Angblad et al. 2001). We believe that this study can be of interest to all stakeholders that interact with Swedish financial reports. Understanding the underlying factors that facilitate or mitigate earnings management enables stakeholders, such as investors or creditors, to make better decisions. This study could also allow for better and more effective legislation on behalf of regulatory authorities and standard setters whilst simultaneously contributing to the larger debate on the topics of earnings management and sphere ownership.

1.5 Limitations

One limitation of this paper is the use of residuals from accrual models as proxies for earnings management. Although this is standard practice in earnings management research, it does assume that accounting measurement systems capture the fundamental processes without error (Dechow et al. 2010). As Dodd and Graham (1934) explains it, the value of underlying data varies depending on the enterprise. This could be due to management making poor forecasts, items that should be expensed being ignored, transactions being structured to avoid accounting implications etc. (Dechow et al. 2010).

Part of the issues with endogeneity was mitigated through the use of both Random Effects and Propensity Score Matching. Despite that, there could potentially still be reverse causality. Family-spheres could choose to invest in, or choose to retain positions in firms that engage in less earnings management to a larger extent than firms that manage earnings more. We are therefore not able to conclusively determine if the relationship between family sphere ownership and earnings management is causal.

1.6 Structure of the paper

The remainder of the paper is structured as follows. In section 2, the Swedish ownership setting and spheres are given a brief introduction. In section 3 the theoretical framework of the paper is presented, followed by an empirical literature review as it relates to our study in section 4 and the formulation of our hypotheses in section 5. Section 6 goes into more detail on earnings management and the estimation technique used in this paper. Section 7 presents the sample construction, variable definitions, descriptive statistics and the univariate analysis. This is followed by a presentation of the research methodology in section 8. The multivariate analysis, and the interpretation of the results from our models are then presented in section 9. Lastly, conclusions from the study are presented in section 10.

2. The Swedish ownership setting

Background

The Swedish corporate ownership model is distinct in a number of ways. Some of the country's key attributes are: use of dual-class shares, pyramidal structures, cross-holdings by ownership, (Agnblad et al. 2001) and the prevalence and influence of ownership spheres (Fristedt & Sundqvist, 2009). This uniqueness can be dated back to the aftermath of the financial crises of the 1920s and 1930s (Jakobsson & Wiberg, 2014). In 1934, the Swedish equivalent of the Glass-Steagall Act[2] prohibited banks from directly owning company shares (Högfeldt, 2005). This was circumvented through the use of holding companies, which were separated from banks and classified as Closed-End-Investment-Funds (CEIFs). The use of three-level pyramids with a sphere at the top, a holding company (CEIF) in the middle and portfolio companies at the bottom became the norm for Swedish corporate ownership (Jakobsson & Wiberg, 2014). A parallel phenomenon that facilitated the emergence of concentrated ownership was Sweden's exclusion of foreign investments. During the 1800s, foreign ownership of companies that owned natural resources or real estate was very limited for foreign investors (Högfeldt, 2005). For the majority of the 1900s, foreign investors could only own free shares[3] in Swedish listed companies (Jakobsson & Wiberg, 2014). The aggregate voting power of free shares could not exceed 20 % of voting power (Jakobsson & Wiberg, 2014). In 1993, in connection to Sweden's entrance to the European Union, these restrictions were lifted, opening the Swedish capital markets to foreign investors. From 1990 to 2000, foreign ownership increased from 8 % to more than 40 % (Holmén, 2011). As Sweden's EU membership started becoming a reality it became clear to the powerful Swedish owners that foreign investors would enter the capital markets. As a response, dual class shares were heavily issued to maintain ownership. By the early 90s, most public firms had dual class shares (Jakobsson & Wiberg, 2014).

[2] The Glass-Steagall Act of 1933 (formally named the Banking Act) effectively separated commercial and investment banking by prohibiting commercial banks from underwriting, holding or dealing in corporate securities in the United States (Kroszner & Rajan, 1994).

[3] "Free shares" was the name of shares that could be owned by foreign investors.

CEIFs

CEIFs enjoy some tax advantages. Both dividends received and capital gains are tax exempt if reinvested. The tax structure in combination with pyramidal ownership essentially incentivises spheres to have a restrictive dividend policy in the portfolio firms and to reinvest realised capital gains (Holmén & Högfeldt, 2009). The two most prominent Swedish examples of CEIFs are Investor, tied to the Wallenberg-sphere (see appendix 3), and Industrivärden, tied to the Lundberg-sphere. Both spheres have a very long-term investment philosophy (Wallenberg, n.d; Lundbergs, n.d). This is to be expected, considering the tax policies for CEIFs.

Spheres: Background

In 1965, the party leader for the Swedish left-communist party, Carl-Henrik Hermansson published the book "Monopoly and Big Finance - the 15 families" mapping out that a small number of families dominated the corporate landscape in Sweden. This publication, together with two publications of "Who owns what in Swedish Industry" published by Birgitta and Olof Forsgren in the 1950s and 1960s pioneered the identification of Swedish corporate ownership (Fristedt & Sundqvist, 2009). Although many of the original 15 families identified by Hermansson have lost influence, others are still controlling major parts of Swedish industry to this day (Allelin et al. 2018). The term "sphere" was coined by Sven-Ivan Sundqvist in the book series "Owners and Power in Sweden's Listed Companies", published annually between 1985 and 2009. In these books, Sundqvist and co-authors mapped out 25 spheres per year (Fristedt & Sundqvist, 2009). As the internet became widely used in the 2000s, sales declined, and the book series was subsequently discontinued in 2009. However, in 2015, after a grant from The Foundation of Jan Wallander and Tom Hedelius, the editions from 2010 to 2015 could be released (Sundqvist, 2015). Later that year, Modular Finance acquired the publisher of the books, SIS ägarservice, and incorporated the data in their database *Holdings* (Hedborg & Sundqvist, 2015). Through e-mail contact with Modular Finance, we received information regarding how spheres are currently constructed in the Holdings database. This is of importance because we rely on their sphere classifications in this study. The key identifiers for spheres are that multiple shareholders vote in uniform at the annual general meeting and/or have a common underlying ownership structure. Nevertheless, they point out that there is no official

definition available, and that sphere classification is somewhat subjective. See appendix 2 for a list of spheres found in our dataset.

Spheres: Definition and characteristics

The term "sphere" has no clear definition, no clear international comparisons and relies heavily on subjective interpretation (Agnblad et al. 2001). However, broadly defined, spheres are a group of shareholders with the same interests. This interest unity was originally determined by Sundqvist, based on voting history, with a high degree of subjectivity (Sundin and Sundqvist, 1998; Fristedt & Sundqvist, 2009). Usually, for a group to receive sphere-status they would also need to influence at least three public companies (Fristedt & Sundqvist, 2009). Another shared characteristic of groups regarded as spheres is typically pyramidal ownership commonly consisting of three layers with a family on top, a holding company (CEIF) in the middle and portfolio firms at the bottom (Milne, 2015; Holmén & Högfeldt, 2009). By using pyramidal ownership and dual-class shares, spheres can gain a majority or a large minority of voting rights without controlling an equal amount of equity. To further understand the sphere concept, it's important to note that some spheres have played an extremely large role in the Swedish economy. In 1997, the two largest spheres, The Wallenberg-sphere and the Handelsbanken-sphere together controlled 63.4 % of the Stockholm Stock Exchange (Henrekson & Jakobsson, 2008). More recently, in 2017, it was reported that 15 families control roughly 70 % of the Stockholm Stock Exchange (Allelin et al. 2018). For examples of sphere structures, see appendix 3 and appendix 4.

Possible implications of spheres as owners

Sphere ownership could have unique implications from a corporate governance perspective. However, since both theoretical and empirical research on this ownership type is very scarce, we can only speculate about what these implications might be. Kugler et al. (2012) synthesises the literature that compares strategic behaviour of groups and individuals in numerous game theory games. The general pattern is that group decisions are more in line with the game theoretic assumption of rationality. This can be explained by the fact that groups, compared to individuals, have more experience, better processing capabilities, better self-monitoring abilities and have access to a larger

pool of information. We hypothesise that this may imply that spheres therefore are capable of making more rational and self-serving decisions as owners. From a social psychology perspective, sphere ownership can however be viewed through the lens of groupthink theory. The theory suggests that members within a group will strive for consensus, and disregard personal beliefs and adopt opinions of the group (Janis, 1971). The theory was originally applied in military and political contexts, but since the conception of groupthink, a lot of evidence has supported the view that this phenomenon occurs in a very wide range of group settings (Baron, 2005). Considering that spheres are groups that vote in uniform, often centred around a family or organisation, we speculate that groupthink may apply in this context. This means that discouragement of debate and deviating ideas, could be prevalent in sphere settings, resulting in poorer decision quality in corporate governance. Expectations regarding the implications can also be made by looking at voting coalitions, because this ownership structure is more researched and shares many attributes with spheres. Bennedsen & Wolfenzon (2000) theoretically prove that coalitions that have grouped cash flows, internalise consequences of decisions to a larger extent than individual owners, and subsequently take better actions. By analogy, this indicates that spheres may make better decisions than other owners. Despite these possible implications, it's important to point out that spheres are a heterogeneous ownership form that can vary greatly in size, motivation etc. and remain We therefore remain somewhat agnostic as to what implications sphere ownership may have on governance.

3. Theoretical framework

3.1 Earnings management

For various stakeholders to be able to make well informed decisions it is important that the financial reporting on which decisions are made is of high quality, meaning that it reflects the true state of the business (Healy & Wahlen, 1999). In order for management to be able to provide stakeholders with information that reflects this true state of business, a certain degree of freedom in accounting rules is needed. In practice this is commonly handled through what is referred to as accrual accounting. According to Dechow and Skinner (2000) the principal goal of accrual accounting is to help investors assess the economic performance of a company during a certain period of time through the use of basic accounting principles like revenue recognition and matching. These adjustments, made by managers have an impact on reported earnings, thereby providing room for management to manipulate the numbers in a desired direction (Dechow & Skinner, 2000). The activity of management manipulating earnings in order to achieve a desired outcome is generally referred to as earnings management (hereafter called EM). There are a number of definitions used when referring to EM. In this paper, the chosen definition is the following by Healy and Wahlen (1999):

"Earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

According to Braam et al. (2015) there are two strategies for EM; *real EM* and *accrual-based EM*. Prior research indicates that firms use both strategies depending on the situation (Braam et al. 2015; Badertscher, 2011; Cohen et al. 2008; Zang, 2012). Below the different strategies are presented in further detail.

Real earnings management

According to Roychowdhury (2006), real EM refers to actions where the execution of real business transactions is altered with. By adjusting the structuring or timing of transactions, firms can impact earnings in order to e.g. meet or exceed certain targets, which in turn directly impacts cash flow and potentially long-term economic value. Real EM strategies are, therefore, often considered to be relatively costly compared to accrual-based EM strategies (Graham et al. 2005). An advantage with real EM from management's perspective, in comparison with accrual-based EM, is however the increased difficulty in detecting and estimating the extent to which it takes place (Graham et al. 2005; Badertscher, 2011).

Accrual-based earnings management

On the contrary to real EM, accrual-based EM aims to obscure or mask true economic performance by changing accounting principles, methods, or estimates within the legal limits (Dechow & Skinner, 2000). Importantly, accrual-based EM does not generally involve altering operations themselves but rather misrepresents reported numbers of the firm's underlying operating performance (Kothari et al. 2016). This type of EM is easier to detect and estimate than real EM and is therefore widely more studied.

Within the area of accrual-based EM, a significant amount of research differentiates "discretionary accruals" from "non-discretionary accruals" by modelling the accrual process. Non-discretionary accruals are intended to capture adjustments reflecting underlying performance whereas discretionary accruals are intended to capture misrepresentations caused by utilisation of accounting methods or principles (Dechow et al. 2010). Discretionary accruals can lead to increases as well as decreases in the quality of reported earnings and in the information asymmetry between the two parts. By extension, stakeholders are provided with either improved or aggravated information depending on what management's purpose is (Healy & Wahlen, 1999; Kothari et al. 2005). On one hand, management possesses unique knowledge about the company and are therefore better equipped to portray the true state of the business. On the other hand, accruals also provide management with an opportunity to deliberately manipulate reported numbers for their own gain

or to mislead stakeholders, thus leading to a deterioration in reporting quality (Healy & Wahlen, 1999; Francis et al. 2005). A separation between the legitimate and deceptive discretionary accruals, however, is difficult to make since the positive effects are difficult to distinguish from the negative ones. Accordingly, total discretionary accruals are, as standard practice in EM-literature, used as a proxy of earnings manipulation, without making any distinction (Dechow et al. 2010).[4]

Mohanram (2003) demonstrates that firms practise EM in a variety of ways and for multiple different reasons. He suggests that all EM is done with respect to the position of earnings in relation to some sort of benchmark, outlining three specific ways in which EM is used (Mohanram, 2003). *Bump up* is the name for when firms inflate earnings slightly when performance is close to, but just under a benchmark. The benchmark that managers try to meet through EM could for example be; last year's performance (to show improvement), zero (to show profitability), analyst expectations (to be seen as an overperformer), or a bonus threshold specified in a compensation contract (to increase personal compensation). In either case, the nonlinearity between earnings and stock price, compensation or stakeholder perception is at the core of bump up EM. The closer a firm is to the benchmark, the more tempting it is to use bump up to reach the benchmark or target (Mohanram, 2003). Secondly, in cases where firms are far from meeting the benchmark and bump ups become infeasible, a different type of EM can be done instead: *big bath*. If a target will be missed, missing it even more has small costs, leading to underreporting. By undertaking income decreasing decisions in a given year, the earnings in the future can be increased which can cause the illusion of a turnaround (Mohanram, 2003). Thirdly, when firms comfortably meet a benchmark, the benefits for beating it even more is low. In this case, firms could have incentives to understate earnings. This phenomenon is known as *Cookie Jar* EM and similarly to when using big baths, the intent is to save capabilities to inflate earnings if needed in the future (Mohanram, 2003). The use of Cookie Jar EM can also be used to moderate the ratchet effect, which occurs as expectations increase with good performance (Mohanram, 2003).

[4] In later chapters of this paper the term discretionary accruals will be used interchangeably with the term earnings management (EM).

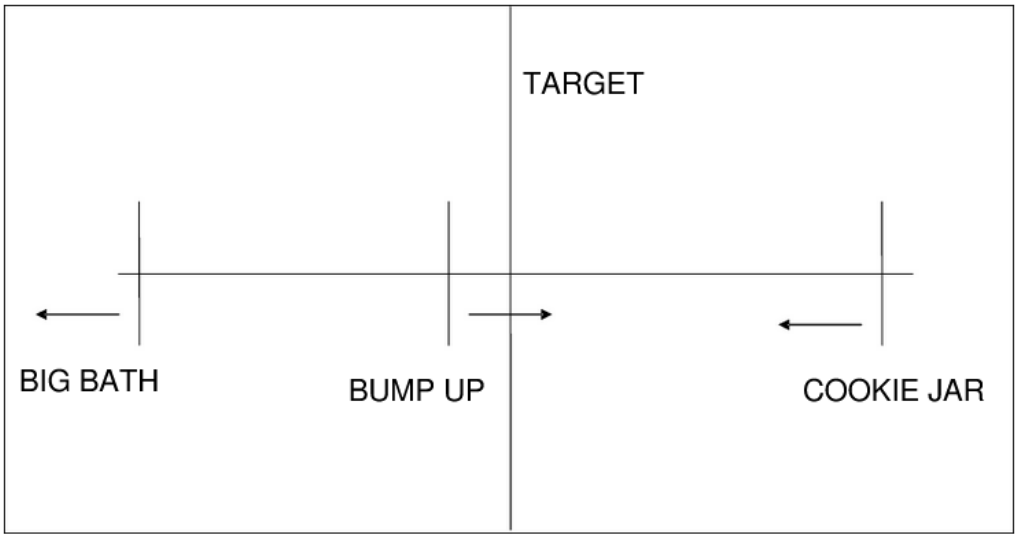

Diagram 1: The three main types of earnings management (Mohanram, 2003)

3.2 Agency theory

Agency theory is among the most prevalent theories used to analyse the relationship between ownership structures and earnings management in the literature. The theory highlights the problems that arise when there is separation between ownership and control, assuming that both parties are utility-maximising (Jensen & Meckling, 1976). Agency theory furthermore separates the conflict into two types, usually referred to as Type I and Type II agency problems (Jensen & Meckling, 1976; Fama and Jensen, 1983). Type I describes the relationship between the shareholders (principal) and management (agent), where managers can utilise the information asymmetry to expropriate wealth from the owners (Shapiro, 2005). According to Fama and Jensen (1983), monitoring managerial decisions and establishing appropriate incentives, in this setting, becomes essential to assure that shareholders' interests are protected. Type I agency conflicts in relation to EM is a thoroughly researched area which largely focuses on corporate governance characteristics such as incentives, board composition or management characteristics (DaDalt et al. 2003; Cornett et al, 2008; Klein, 2002; Bergstresser & Philppon, 2006). The type II agency problem, on the other hand, describes the potential conflict that could arise between controlling shareholders and minority shareholders (Jensen & Meckling, 1976; Shapiro, 2005). In the Swedish setting, characterised by highly concentrated ownership, an extensive use of dual-class shares, pyramidal structures and cross-

holdings by ownership spheres (Agnblad et al. 2001), type II problems are especially important. Large, controlling owners (e.g spheres), in this setting, may have opportunities to extract private benefits of control when they make decisions based on private motivations, to maximise their own utility rather than that of all shareholders (Berle & Means, 1932; Shleifer & Vishny, 1997). Fama and Jensen (1983) argue that combined ownership and control are a source of greater agency conflicts. Meanwhile, Shleifer and Vishny (1997) argue that concentrated ownership might carry benefits from an agency theory perspective, by having controlling shareholders exerting greater monitoring of management. Building on this reasoning, Wang (2006), argues that agency theory predicts that controlling ownership can affect the level of earnings management in two competing ways: the entrenchment effect and the alignment effect.

The entrenchment effect

The entrenchment effect argues that when a company has concentrated ownership, the controlling owners, (e.g. spheres), will expropriate wealth from minority owners (Shleifer and Vishny, 1997). By appointing directors and managers with affiliations, the controlling owner can extract private benefits of control (i.e minority expropriation). According to Bao and Lewellyn (2017), EM becomes a likely consequence of this ownership concentration since controlling owners through their significant influence over management are likely involved in the production of the company's accounting information. Bao and Lewellyn (2017) furthermore claim that controlling owners may have incentives to mask true economic performance. As an example the authors bring up a situation where expropriation has resulted in lower reported earnings, incentivising management to manipulate earnings upward to avoid revealing information about their misbehaviour (Bao & Lewellyn, 2017; Ding et al. 2007). Thus, the entrenchment effect predicts that sphere controlled firms would be associated with higher levels of EM than non-sphere controlled firms.

The alignment effect

Contrary to the entrenchment effect, the alignment effect argues that the interests of controlling owners, in our case spheres, and minority owners are better aligned due to the large amount of shares held by the controlling owner and their long-term interests in the company (Wang, 2006). The

alignment effect therefore predicts that sphere controlled firms would be less inclined to pursue private benefits of control and expropriate wealth from minority owners by engaging in EM. Additionally, since EM is often associated with a short-term perspective and could prove costly in the long run, controlling owners' willingness to preserve reputation and wealth might constrain them from opportunistically engaging in EM for private gains (Wang, 2006).

3.3 Stewardship theory

In contrast to conventional agency theory, stewardship theory suggests that managers aren't necessarily opportunistic and, in some contexts, instead want to be good stewards of corporate assets. In these situations, incentives of principals and stewards are naturally aligned (Donaldson & Davis, 1991; Davis, Schoorman, & Donaldson, 1997). The stewardship theory isn't necessarily inconsistent with agency theory, and the respective theories can be more or less applicable, depending on the situation. Further, it is proposed that in collectivist settings, principal-steward relationships are more likely to be found than in individualistic settings (Davis et al. 1997). Prencipe et al. (2014) proposes that stewardship theory is particularly applicable when individuals share a similar network, where relationships are stable and where there is significant interdependence, e.g. family firms. Considering that spheres often share characteristics with, and often are families, it is reasonable that stewardship theory can be applicable for spheres in general, and for family spheres in particular. Ergo, following this reasoning, firms with family spheres as controlling owners may engage in less EM than firms with non-family spheres as controlling owners.

3.4 Socioemotional wealth theory

In recent years, SEW theory has become increasingly popular in the literature that explores the intersection between EM and family ownership (Martin et al. 2016; Achleiter et al. 2014; Paiva et al. 2019). The theory claims that family-owned firms' primary motivation is the preservation of their socioemotional wealth (SEW) rather than economic optimization (Gomez-Mejia et al. 2007). SEW can manifest itself in a variety of ways. Expressions include; the ability to exercise authority, the utility gained from belonging, the spread of family values through the business, conservation of the family dynasty, conservation of the family's social capital, the fulfilment of family value-based

obligations based on blood rather than merit, the ability to be altruistic to other family members. Berrone et al. (2012) instead uses a five-dimension framework to summarise SEW, called FIBER, an abbreviation for Family Control, Influence, Binding Social Ties, Emotion Attachment, Renewal of family bonds through dynastic succession. The SEW theory specifically predicts that family-firms are more tolerant of below target performance if it increases the chances of retaining family control (Gomez-Mejia et al. 2007). By extension, incentives for EM in family-controlled firms could be lower than for their non-family counterparts. Due to the similarities between spheres and families, the theory suggests that firms with sphere ownership should engage in less EM, and that this effect should be especially pronounced for family spheres.

4. Empirical literature review

While no earlier research to the extent of our knowledge has explored the particular relationship between sphere ownership and EM, various studies have investigated the relationship between ownership structure and earnings management. Often this is done through the lens of family ownership or institutional ownership. Since spheres share certain characteristics with both family owners and institutional owners, studies done on these ownership types are useful analogues, and will be used to extrapolate expectation and contextualise our results. Furthermore, we borrow from the literature on other ownership dynamics that may impact earnings management, such as concentrated and controlling ownership.

Family Ownership

Generally, the literature on family ownership and EM leans towards the view that firms with family ownership tend to engage in less EM than other firms. Wang (2006) studies the relation between founding family ownership and earnings quality and finds that founding family ownership was associated with higher earnings quality and lower levels of EM. This is based on a sample of 3456 firm-year observations on the S&P 500 between 1994 and 2002. Similarly, Martin et al. (2016) compares EM in family-owned with other firms in the S&P 500 from 1992 to 1999 using a sample of 1149 firm-year observations and finds that family firms engage in less EM. The study finds that family firms engage in less EM than non-family firms and explains the results using socioemotional wealth theory. Tong (2007) also compares EM between family and non-family firms in the U.S. Using a sample of 3040 firm-years between 1992 and 2003, finding that family firms have lower absolute discretionary accruals than non-family ones. Similar results have been found in continental Europe. Achleitner et al. (2014) studies EM in 838 German firms between 1998 and 2008 with findings consistent with the American studies, reporting that family-firms engage in less earnings management. Some researchers however, find support for family-firms engaging in more EM than their non-family counterparts. Chi et al. (2015) uses a sample of 379 technology firms listed on the

Taiwanese stock exchange during a seven-year period. The study finds that family-firms engage in more EM and that the proportion of board independence interacts by decreasing EM.

Similarly, Ding et al. (2011) find that family firms have higher discretionary accruals and lower accounting quality than non-family firms. This finding is based on a sample of 1542 listed non-state firm years in China from 2003 to 2006. Furthermore, Bardhan et al. (2015) studies the relationship between family firms and the quality of internal control over financial reporting, relative to non-family firms. Using a sample of 446 S&P 500 firms, the authors report results consistent with the entrenchment argument that family owners are motivated to maintain weaker controls in order to extract private benefits (Bardhan et al. 2015).

Institutional ownership

Regarding the relationship between institutional ownership and EM, there is some evidence in the literature supporting that firms with institutional investors engage in less EM than other firms. This is assumed to be because institutional owners are better and more efficient in monitoring management (Mehrani et al. 2017). Velury and Jenkins (2006) investigates whether institutional ownership affects the quality of reported earnings using a sample of 4238 firm-year observations in the U.S. The results demonstrated a positive relationship between institutional ownership and higher quality earnings but also that concentrated institutional ownership may negatively affect earnings quality. Jung and Kwon (2002) also explores possible associations between institutional ownership and earnings informativeness. Using a sample of 2820 firm-year observations for firms listed on the Korean Stock Exchange between 1993 and 1998, the authors find that earnings informativeness increases with the holdings of institutions (Jung & Kwon, 2002). Furthermore, previous researchers have found that the relationship between EM and institutional investors largely depends on the investment horizons. Koh (2007) researches the effect of different types of institutional investors on EM between 1995 and 1998. Using a sample of 5150 firm years in the U.S, the study finds that long term institutional investors play a role in mitigating aggressive EM. The author argues that these findings are consistent with the view that investors with long-term horizons don't fixate on yearly earnings, which decreases incentives for EM.

Concentrated ownership

Concentrated ownership has in multiple studies been proposed to be a determinant of poor governance practices (Stulz, 1988; Claessens et al. 2000). In accordance with the entrenchment effects, presented in the earlier chapter on agency theory, this would be explained by the fact that when ownership exceeds a certain level, it becomes easier for majority owners to gain control over managers. Fan and Wong (2002) studies the relationship between corporate ownership structure and the informativeness of accounting earnings, using a sample of 977 companies in seven East Asian economies. The authors find evidence for two things. Firstly, they claim that concentrated ownership and the associated pyramidal and cross-holding structures create agency conflicts between controlling owners and outside investors. Consequently, this is causing reported earnings to be perceived as non-credible to outside investors due to a belief that controlling owners are affecting them for self-serving purposes. Secondly, they find that concentrated ownership is associated with lower earnings informativeness (Fan & Wong, 2002). Similarly, Bao and Lewellyn (2017) studied the relationship between ownership structure and EM in 24 emerging markets, using a sample of 1200 firms. They found that controlling ownership is a significant driver of EM, however the effect weakens with increasing minority shareholder protection (Bao & Lewellyn, 2017).

5. Hypotheses

Theory provides us with conflicting views on the relationship between Sphere ownership and EM. On one hand, the entrenchment effect predicts that sphere ownership would be associated with higher levels of EM. On the other hand, the alignment effect in combination with stewardship and socioemotional wealth theory predicts the opposite relationship, with sphere-controlled firms being associated with lower levels of EM. By analogies from previous empirical research, evidence supporting both perspectives has furthermore been documented. We think that the conflicting views provided by theory and previous research makes investigating the relationship between ownership spheres and EM highly interesting. To further explore a possible relationship between the two, we will use the following open-ended hypothesis:

Hypothesis 1

H_1: Sphere ownership does not have a significant impact on the level of earnings management.

H_{a1}: Sphere ownership has a significant impact on the level of earnings management.

Furthermore, we note that spheres, as an ownership classification type, have high levels of heterogeneity in multiple dimensions. Based on the theory and empirical literature presented in chapter 3 and chapter 4, we suspect that controlling ownership by family spheres and non-family spheres may have somewhat different implications for earnings management. We will explore this notion by splitting spheres into family-controlled spheres and non-family controlled spheres. To continue we will also test the following two hypotheses:

Hypothesis 2

H_2: Family-sphere ownership does not have a significant impact on the level of earnings management.

H_{a2}: Family-sphere ownership has a significant impact on the level of earnings management.

Hypothesis 3

H_3: Non-family sphere ownership does not have a significant impact on the level of earnings management.

H_{a3}: Non-family sphere ownership has a significant impact on the level of earnings management.

6. Estimating earnings management

Since accrual-based EM is unobservable in financial reports, it has to be estimated through econometric techniques. McNichols (2000) states that a fundamental element in testing for EM is finding an appropriate measure of management's discretion over earnings. Over the years, a variety of models and estimation techniques have been developed. As described in section 2.1, a significant amount of research differentiates discretionary accruals from non-discretionary accruals. This is done by attempting to identify discretionary accruals based on the relation between total accruals and hypothesised explanatory factors (Dechow et al. 2010; McNichols, 2000).

Healy (1985) and DeAngelo (1986) first introduced the concepts of using total accruals and changes in total accruals, respectively, to measure managers' discretion over earnings. The techniques for dealing with the inherently difficult task of estimating EM have since been developed further, maybe most notably through the model proposed by Jones (1991). In her model, Jones introduces a regression approach in order to estimate discretionary accruals. The model controls for non-discretionary factors believed to influence accruals by estimating a linear relationship between total assets and changes in sales and PP&E. Historically, the *Jones Model* has been one of the most prevalent in EM literature (McNichols, 2000). However, Dechow et al. (1995) found a weakness in the original Jones model and proposed a minor modification to improve it. Their criticism was concerning the model implicitly assuming all sales are non-discretionary and suggested a modification to reduce sales by the difference in receivables with the implicit assumption that differing credit sales is a result of earnings management (Dechow et al. 1995). By detecting sales-based manipulation, this new model, called the Modified Jones model (hereafter called MJM), was claimed to provide a more powerful test for EM. The authors provided evidence for this statement by comparing the degree of explanation between different accrual-based models including the Healy model, the DeAngelo model, the original Jones model, and their suggested changes in the MJM (Dechow et al. 1995). The results are further supported by Bartov, Gul, and Tsui (2001), using the MJM in a cross-sectional model comparing EM in different industries. Over time, the MJM has

become the model most prevalent in EM literature and this is also the model that will be used in our study.[5]

Modified Jones Model

The following steps are used in order to estimate discretionary accruals using the MJM. Firstly, total accruals need to be calculated. This can be computed in two ways, either from successive balance sheet data or from the statement of cash flows (Cornett et al. 2008). According to Hribar and Collins (2002), the cash flow statement approach is preferred over the balance sheet method due to the possibility of measurement errors occurring as a result of non-operating activities such as acquisitions, mergers or divestitures. This study therefore makes use of the cash flow method in which the calculation of total accruals is done according to the following formula (Cornett et al. 2008):

$$\textit{Total Accruals} = \textit{Net Income} - \textit{Cash Flow from Operating Activities}$$

(Eq. 1)

Secondly, discretionary accruals are estimated for all firms through an Ordinary Least Squares (OLS) regression according to *Equation 2*. Following Bartov et al. (2001), a cross-sectional model, estimating regressions independently for each year is used. This allows us to use industry-year fixed effects, grouping firms by their two-digit ICB code. Industries with fewer than ten observations per industry-year are excluded from the sample to gain sufficient power in the regressions in accordance with Kothari et al. (2005). An exception was made for the industries Consumer Staples and Consumer Discretionary, which were combined under the name Consumer Goods to gain a sufficient number of observations. In equation 2 below, the model used to estimate discretionary accruals is specified.

[5] The original Jones Model and a further development of the MJM, called the Jones Cash Flow Model, are also used as robustness controls later on.

$$\frac{TA_{it}}{Assets_{t-1}} = \alpha_0 \frac{1}{Assets_{t-1}} + \alpha_1 \frac{(\Delta Sales_{it} - \Delta Receivables_{it})}{Assets_{t-1}} + \alpha_2 \frac{PPE_{it}}{Assets_{t-1}} + \varepsilon_{it}$$

(Eq.2)

TA_{it} denotes total accruals for firm i in year t. $\Delta Sales_{it}$ denotes the change in sales between years t and $t-1$ for firm i, $\Delta Receivables_{it}$ denotes the change in receivables between years t and $t-1$ for firm i, PPE_{it} denotes gross property, plant & equipment for firm i in year t. All variables are scaled by one-year lagged total assets, denoted as $Assets_{t-1}$ and winsorized at the 1st and 99th percentiles to avoid distortion of our estimations and inference. ε_{it} denotes the residual term for firm i in year t which is also the value of the discretionary accruals later used as a proxy for EM (Dechow et al. 1995). The estimated discretionary accruals are transformed into absolute values. This is done because discretionary accruals must eventually be reversed and because the purpose of this study is to investigate whether spheres influence the level of EM, with disregard to if it is used for inflating or deflating earnings. The use of absolute earnings management is standard practice in EM research, where a higher value of absolute discretionary accruals implies a greater level of EM (Dechow et al. 2010; Klein, 2002; Bergstresser & Philippon, 2006; Tong, 2007; Wang & Yung, 2011). One downside with this is that detailed analysis of the different EM types discussed in section 2.2 (Bump up, Cookie jar, etc.) cannot be made.

7. Data description

7.1 Sample universe

The sample examined in our study covers firms listed on the Stockholm Stock Exchange (SSE Nasdaq OMX) over the period 2010 – 2020. Data on ownership and governance was collected through the Modular Finance Holdings[6] database for all firms listed during the period. As mentioned in chapter 2, SIS Ägarservice[7] (and data on ownership spheres) was acquired by Holdings in 2015 (Hedborg & Sundqvist, 2015), motivating Holdings as a source. Financial data was collected using Refinitiv Eikon.[8] In order to avoid survivorship bias in the sample, firms that were not listed throughout the full eleven-year period were also included. However, firms had to fulfil a condition of being listed for at least two consecutive years during the period since this is required in order to estimate discretionary accruals using the Modified Jones Model. These criteria yielded an initial sample of 4505 firm-year observations. Firm-year observations with missing data points necessary for the calculations of EM were then excluded. In accordance with Peasnell et al. (2000) firms classified as "Financial" were completely excluded from the sample due to their financial reports and accruals differing from other types of firms. Using two-digit ICB-codes, we grouped firms by industry in order to estimate EM. As described in chapter 6, industries with fewer than ten observations per industry-year are excluded from the sample to gain sufficient power in the regressions in accordance with Kothari et al. (2005). An exception was made for the industries Consumer Staples and Consumer Discretionary which were combined under the name Consumer Goods to gain a sufficient number of observations. The industries excluded due to an insufficient number of observations were; Telecommunications, Energy, and Utilities. The final sample used in

[6] Modular Finance Holdings is a database which provides data on ownership structure and corporate governance. It is arguably the most complete and frequently updated database covering ownership on the Swedish market.

[7] SIS Ägarservice was the publisher of "Owners and Power in Sweden's Listed Companies", which first categorised firms into spheres.

[8] Refinitiv Eikon by Thomson Reuters is a database frequently used in academia and industry.

the empirical analysis consists of an unbalanced panel of 1,704 firm-year observations for 243 firms across six industries. Table 1 presents firm-level statistics for each industry and year.

Table 1. Final sample, firm-level statistics for each industry-year.

	Year											
Industry	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Total**
Basic Materials	13	13	11	12	13	12	14	13	14	13	14	142
Consumer Goods	29	33	28	29	31	33	39	44	45	50	34	395
Health Care	16	20	16	15	22	21	21	31	36	37	34	269
Industrials	36	43	32	37	44	49	48	50	52	57	52	500
Real Estate	11	10	10	10	14	16	14	17	18	20	17	156
Technology	21	21	22	16	20	21	23	23	25	27	23	242
Total	**126**	**139**	**119**	**119**	**144**	**152**	**159**	**178**	**190**	**204**	**174**	**1 704**

Note: Table 1 provides an overview of the final sample firm-level statistics for each industry and year in our study. Consumer Staples and Consumer Discretionary were combined under the name Consumer Goods.

7.2 Variables

7.2.1 Dependent variable

The dependent variable in this study is the absolute value of the discretionary accruals, estimated using the MJM, described in detail in chapter 6 (Bergstresser & Philippon, 2006; Martin et al. 2006).

7.2.2 Explanatory variables

The main explanatory variable of interest in our study is *Controlling Sphere Ownership*, expressed as a dummy variable. It assumes a value of 1 if the largest owner by voting power is a sphere and has at least 5 % of votes, 0 otherwise. Using the largest voting block to proxy for control is common in the family firm literature (Ben-Amar, 2006), and the 5 % threshold is used in accordance with Martin et al. (2016). We chose the 5 % threshold in part because The Swedish Financial Supervisory Authority uses 5 % as a cut off for "major shareholders", with rules stating that these owners must submit notifications regarding changes in holdings of companies on regulated exchanges (Finansinspektionen, 2022). For identification of ownership spheres, we rely on the categorizations made by Modular Finance Holdings, as mentioned in chapter 2. In total, 80 Swedish spheres within our measurement period are amongst the five largest owners in a listed company in any year. Among

the 80 spheres, most are families with only a few significant major positions. However, there are a small number of family-spheres with controlling positions in many companies (e.g. the Wallenberg-sphere). Some spheres (e.g. Raysearch Founders) consist of founders of a firm and some spheres are institutional (e.g. the Handelsbanken-sphere). See Appendix 2 for a list of spheres.

7.2.3 Control variables

A number of governance and firm specific variables have been shown to have an effect on EM in the literature and are therefore controlled for. The control variables included in this study are the following: use of dual-class shares, board size, board independence, audit committee, audit quality, firm size, risk, performance and valuation. The variable names, proxies used, and expected relationships are presented below.

Governance controls

Use of dual class shares (*Dual Class*) is a dummy variable equal to 1 if the firm has more than one class of outstanding shares and 0 otherwise. Nguyen & Xu (2020) finds that firms with dual-class shares engage in less EM, whereas Francis et al. (2005) opposite results. We have no expectations regarding the relationship dual-class shares have with EM. Similarly to Abed et al. (2012) we control for *Board Size*, measured by number of members on the board of directors. We do not however have any expectation regarding the direction, since studies are showing ambiguous results of the association. *Board Independence* is a ratio measured by independent board members divided by total board members. Klein (2002) and DaDalt et al. (2003) find a negative relationship between level of board independence and EM. We expect to find a similar result. The variable *Audit Committee* is expressed as a dummy variable, assuming a value of one if the firm has an audit committee. Klein (2002) finds a negative relationship between audit committees and EM, and we expect to find similar results. Audit quality is inferred through the use of the dummy variable *Big 4 Audited,* assuming a value of one if the firm was audited by one of the big-four accounting firms (PwC, Deloitte, KPMG or EY) in the respective year. This control variable is standard in EM research and is expected to have a negative association with the dependent variable similar to Fanaday et al. (2020) and Dechow et al. (2010).

Firm controls

Firm Size is proxied by the natural logarithm of total assets as done by Klein (2002). The variable is expected to be negatively associated with EM. *Leverage,* calculated as total debt divided by total assets, is used as a proxy for risk. Risk is expected to be negatively associated with our dependent variable, in accordance with findings by Bassiouny et al. (2016) and Fanady et al. (2020). The variable *ROA* (return on assets) acts as a proxy for performance and is calculated as net income divided by total assets. The variable is commonly controlled for, however with conflicting findings regarding its association with EM (Ding et al. 2011; Fanady et al. 2020). We are therefore agnostic regarding the relationship between the two variables. *MTB* (Market-to-book) is a proxy for valuation, capturing market sentiment. The variable is customarily controlled for in the EM literature. The coefficient tends to be positive (Martin, 2016; Klein, 2002) and we expect a similar relationship.

7.3 Descriptive statistics and univariate analysis

Table 2 presents descriptive statistics for the variables used in our study. Upon reviewing the first results of the summary statistics we observed some extreme outliers for the accounting variables. In order to avoid distortion of our estimations and to thereby improve the statistical efficiency of our regressions, a decision was made to winsorize all accounting variables at the 1st and 99th percentiles. The winsorized accounting variables are; *Firm Size, Leverage, ROA* and *MTB.* Panel A shows summary statistics for the full sample, including the absolute and non-absolute values of discretionary accruals calculated using the Modified Jones Model (*MJM*). In line with expectations, the mean of the discretionary accruals estimated using *MJM* is close to zero with EM values ranging from -19,7 % to 15,3 % of lagged total assets, indicating that firms manipulate earnings in both directions. The variable *ABS_MJM* is, however, of more interest for us since it will be used later as the dependent variable in our regressions. For *ABS_MJM* a higher value indicates more EM. The variable has a mean of 2,1 % of lagged total assets. Furthermore, the mean for *Sphere Control* tells us that for 40,0 % of the observed firm-years, an ownership sphere is the largest controlling owner with at least 5 % of the votes. 51,8 % of the full sample uses dual class shares and 63,7 % have an audit committee. The mean of the variable *Board Size* is 6,6, and the mean percentage of independent directors is 62,5 %. *Firm Size*, *Leverage*, *ROA* and *MTB* varies greatly within the sample.

Panel B presents a split sample, separated into two groups - Sphere controlled and Non-sphere controlled. Tests for differences in means are conducted using two-sample t-tests, in order to see if the means of the variables significantly differs between observations with and without sphere ownership. We can observe that for the dependent variable *ABS_MJM*, the mean is approximately 1,8 % for firms with sphere ownership and approximately 2,4 % for firms without sphere ownership. The t-test reveals that there is a highly significant (1 % level) difference in means between the two groups, indicating that non-sphere controlled firms engage in more EM. The evidence is suggestive, in favour of a rejection of the null hypothesis, thus warranting further analysis. In accordance with literature presented in chapter 2, we observe that dual class shares are far more prevalent in sphere-controlled firms than in non-sphere controlled firms, significant on a 1 % level. Furthermore, sphere-controlled firms are on average significantly larger than non-sphere controlled firms (23,773 billion SEK vs 7,664 billion SEK) and also tend to have higher return on assets (6,5 % vs 2,0 %). Board Size shows that boards in general are slightly larger in sphere-controlled firms (7,0 vs 6,4), while the level of independent directors and the prevalence of audit committees is higher in non-sphere controlled firms (65,1 % vs. 58,5 %, and 66,5 % vs. 59,5 %, respectively). The t-tests reveal that for all the above-mentioned variables there is a significant difference in means on a 1 % level. Although the difference in board independence between sphere controlled and non-sphere controlled firms is small, we find the result noteworthy. If controlling owners are seeking private benefits at the expense of minority owners, including independent board members is probably not desirable. Moreover, sphere-controlled firms also tend to be marginally higher levered and slightly lower valued on a market-to-book basis than their non-sphere controlled counterparts.

Table 2. Summary statistics and tests of differences in sample means

Panel A: Summary statistics

Variable	N	Mean	SD	P25	Median	P75	Min	Max
MJM (%)	1704	0.075	3.499	-0.772	0.432	1.779	-19.743	15.263
ABS_MJM (%)	1704	2.161	2.752	0.592	1.335	2.556	0.001	19.743
Sphere Control (>5%)	1704	0.400	0.490	0.000	0.000	1.000	0.000	1.000
Dual Class	1704	0.518	0.500	0.000	1.000	1.000	0.000	1.000
Board Size	1704	6.555	1.520	6.000	6.000	7.000	3.000	12.000
Board Independence	1704	0.625	0.241	0.500	0.667	0.800	0.000	1.000
Audit Committee	1704	0.637	0.481	0.000	1.000	1.000	0.000	1.000
Big 4 Audited	1704	0.940	0.238	1.000	1.000	1.000	0.000	1.000
Firm Size	1704	14.102	27.312	0.605	2.530	11.624	0.026	142.978
Leverage	1704	0.216	0.173	0.064	0.200	0.325	0.000	0.680
ROA	1704	0.038	0.153	0.023	0.057	0.094	-0.755	0.381
MTB	1704	3.394	3.493	1.315	2.296	4.080	0.072	21.913

Panel B: Split sample	***Non-sphere controlled***			***Sphere controlled***			***Difference***
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**T-test**
ABS_MJM (%)	1023	2.377	2.931	681	1.838	2.425	0.538***
Dual Class	1023	0.376	0.485	681	0.730	0.444	-0.353***
Board Size	1023	6.235	1.323	681	7.037	1.664	-0.802***
Board Independence	1023	0.651	0.257	681	0.585	0.208	0.066***
Audit Committee	1023	0.665	0.472	681	0.595	0.491	0.070***
Big 4 Audited	1023	0.926	0.262	681	0.960	0.195	-0.035**
Firm Size	1023	7.664	16.778	681	23.773	35.904	-16.108***
Leverage	1023	0.204	0.178	681	0.234	0.164	-0.030***
ROA	1023	0.020	0.181	681	0.065	0.087	-0.453***
MTB	1023	3.568	3.920	681	3.133	2.711	0.435**

Note: Table 2 presents descriptive statistics for the final sample in our study. Panel A shows number of observations, means, standard deviations, medians, 25th and 75th percentiles, minimum and maximum values for all variables within the period of 2010-2020. Panel B provides univariate test results by comparing variable means for the sphere controlled and non-sphere controlled split samples. **MJM** is the estimated discretionary accruals using the Modified Jones Model. **ABS_MJM** is **MJM** transformed into absolute values, used in later regressions as the dependent variable. **Sphere Controlled** is a dummy variable equal to 1 if an ownership sphere controls >5 % of votes in a firm and 0 otherwise. **Dual Class** is a dummy variable equal to 1 if the firm has more than one class of outstanding shares and 0 otherwise. **Board Size** is the number of directors on the board. **Board Independence** is the number of independent directors divided by the number of directors on a board. **Audit Committee** is a dummy variable equal to 1 if the firm has an audit committee and 0 otherwise. **Big 4 Audited** is a dummy variable equal to 1 if the firm is audited by PWC, EY, Deloitte or KPMG and 0 otherwise. **Firm Size** is a firm's total assets in billions SEK, **Leverage** is a firm's debt divided by total assets, **ROA** is a firm's return on assets calculated as net income divided by total assets. **MTB** is a firm's market-to-book ratio. All accounting variables are winsorized at the 1st and 99th percentiles.

**** p<0.01, ** p<0.05, * p<0.1*

Correlation analysis

Table 3 presents a Pearson's correlation table with coefficients for all variables used in the empirical analysis. We can observe a statistically significant relationship between the dependent variable ABS_MJM and all variables except for *Dual Class,* and *ROA*. The results from the correlation table reveals that *Sphere Control* along with *Board Size*, *Audit Committee, Big 4 Audited, Firm Size* and *Leverage* have a negative correlation with the dependent variable whilst *Board Independence* and *MTB* have a positive correlation. Since the dependent variable is EM in absolute values this would economically imply that variables with a negative coefficient appear to have a moderating effect on EM while variables with a positive coefficient appear to increase levels of EM. The results from the correlation table makes further analysis of the relationship between EM and Sphere Control interesting by, similarly to the t-test, indicating that sphere-controlled firms engage in less EM.

Table 3. Pearson's Pairwise Correlation Table

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)ABS_MJM	1.000										
(2)Sphere Control	-0.096***	1.000									
(3)Dual Class	-0.027	0.346***	1.000								
(4)Board Size	-0.148***	0.259***	0.165***	1.000							
(5)Board Independence	0.050**	-0.135***	-0.076***	0.056**	1.000						
(6)Audit Committee	-0.041*	-0.071***	-0.031	0.390***	0.308***	1.000					
(7)Big 4 Audited	-0.047*	0.071***	-0.043*	0.054**	-0.051**	0.039*	1.000				
(8)Firm Size	-0.101***	0.289***	0.215***	0.482***	0.053**	0.201***	0.060**	1.000			
(9)Leverage	-0.151***	0.086***	0.086***	0.103***	0.022	0.056**	0.084***	0.205***	1.000		
(10)ROA	0.005	0.145***	0.141***	0.121***	0.019	0.027	0.020	0.094***	0.032	1.000	
(11)MTB	0.157***	-0.061**	-0.049**	0.025	0.149***	0.096***	-0.122***	-0.096***	-0.296***	0.143***	1.000

Note: Table 3 shows Pearson's correlation table with coefficients across the years 2010-2020. The table reports the pairwise correlation coefficient for the variables later used in the regression models. **ABS_MJM** is the absolute value of the estimated discretionary accruals using the Modified Jones Model. **Sphere Control** is a dummy variable equal to 1 if an ownership sphere controls >5 % of votes in a firm and 0 otherwise. **Dual Class** is a dummy variable equal to 1 if the firm has more than one class of outstanding shares and 0 otherwise. **Board Size** is the number of directors on the board. **Board Independence** is the number of independent directors divided by the number of directors on a board. **Audit Committee** is a dummy variable equal to 1 if the firm has an audit committee and 0 otherwise. **Big 4 Audited** is a dummy variable equal to 1 if the firm is audited by PWC, EY, Deloitte or KPMG and 0 otherwise. **Firm Size** is a firm's total assets, **Leverage** is a firm's debt divided by total assets, **ROA** is a firm's return on assets calculated as net income divided by total assets. **MTB** is a firm's market-to-book ratio. All accounting variables are winsorized at the 1st and 99th percentiles.

**** p<0.01, ** p<0.05, * p<0.1*

8. Research methodology

8.1 Main regression model for multivariate analysis

Since the univariate analysis does not consider other possible explanatory factors, such as firm characteristics, the ability to draw any reliable conclusions regarding the relationship between spheres ownership and EM is limited. However, with the results achieved in the univariate analysis we find that further analysis of the relationship between sphere ownership and EM is motivated. In order to assess the effect of sphere ownership on EM, this study will use a Pooled Ordinary Least Squares (POLS) regression model controlling for industry and year effects, followed by a random effects model to test our first hypothesis. Furthermore, to test our second and third hypotheses, we continue by splitting the sphere-controlled firms into family-sphere controlled and non-family sphere-controlled firms. In order to explore if these subsamples are associated with higher or lower levels of EM, we estimate new regressions using the same methodology as for hypothesis 1. To test the robustness of our results, various robustness controls will be used. The methods and various models are explained in further detail below.

Pooled Ordinary Least Squares (POLS)

Our main model will consist of two regression methods, of which the first one will be in the form of a Pooled Ordinary Least Squares (POLS) regression according to the model below. For definitions and motivations of the variables included in the regression model we refer to chapter 7.2.

$$ABS_{MJM} = \alpha_0 + \alpha_1 Sphere\ Control + \alpha_2 Dual\ Class + \alpha_3 Board\ Size + \alpha_4 Board\ Independence + \alpha_5 Audit\ Committee + \alpha_6 Big\ 4\ Audited + \alpha_7 Firm\ Size + \alpha_8 Leverage + \alpha_9 ROA + \alpha_{10} MTB + \lambda Industry\ Controls + \lambda Year\ Controls + \varepsilon_{it}$$

(Eq.3)

When using POLS, the panel data structure of our data sample is ignored. Observations are instead pooled across time (or group) as well as across the cross-sectional units (Wooldridge, 2016). We control for industry effects (denoted as λ*Industry Controls)* and year effects (denoted as λ*Year Controls)* by creating dummy variables for each industry and year in accordance with DeFond and Park (1997) and Healy (1985). By doing this we allow for the intercept to differ across periods, accounting for the fact that the sample population may have different distributions in different periods (Wooldridge, 2016).

Random Effects

A potential problem when using POLS can be unobserved heterogeneity affecting the dependent variable, causing the model to produce inefficient and biassed estimations (Wooldridge, 2016). Considering the panel structure of our data, a possible way to deal with the problem is to estimate models using *fixed effects* or *random effects*. Fixed effects use a transformation to remove the unobserved effect prior to estimation, thereby allowing for arbitrary correlation between ai and the explanatory variables. Because of this, any time-constant explanatory variable also gets swept away by the fixed effects (Wooldridge, 2016). Since our key explanatory variable *Sphere Control* and several other variables are dummies with little or no variation over time, a fixed effects model cannot estimate these variables' effect on EM. Instead we rely on a random effects model as part of our main model. The random effects model implicitly assumes that the unobserved effect is uncorrelated with all explanatory variables, thereby allowing for variables with little or no variation over time (Wooldridge, 2016). The random effects model is generally estimated by generalised least squares to deal with potential serial correlation in the error term and is according to Wooldridge (2016) preferred to POLS because it is more efficient.

8.2 Pre-regression diagnostics and modelling decision

A potential problem when using the POLS regression method is heteroskedasticity in the data which violates the assumptions of homoskedasticity in linear regressions (Wooldridge, 2016). Heteroskedasticity means that there is not a constant variance between the error term and explanatory variables, which in turn causes incorrectly estimated OLS standard errors. To test for

heteroskedasticity, a White's test was conducted (see Appendix 1). The test statistic of 737,27 and the p-value of 0,00 mean that the null hypothesis of homoskedasticity is rejected and that the assumption does not hold. By extension, this indicates that we cannot rely on our estimated standard errors for inference. To deal with the presence of heteroskedasticity, robust standard errors will be used for all regressions. Furthermore, our data has natural clusters (*firms*). Therefore, the robust standard errors will be clustered by *firm,* for all models in our study.

8.3 Family spheres and Non-family spheres

As previously mentioned in chapter 5, we suspect that control by family spheres and non-family spheres may have different implications for EM. Accordingly, we split spheres into the two separate categories, and repeat the previously described multivariate analysis using the models specified below.

$$ABS_{MJM} = \alpha_0 + \alpha_1 Family\ Sphere\ Control + \alpha_2 Dual\ Class + \alpha_3 Board\ Size + \alpha_4 Board\ Independence + \alpha_5 Audit\ Committee + \alpha_6 Big\ 4\ Audited + \alpha_7 Firm\ Size + \alpha_8 Leverage + \alpha_9 ROA + \alpha_{10} MTB + \lambda Industry\ Controls + \lambda Year\ Controls + \varepsilon_{it}$$

(Eq.4)

$$ABS_{MJM} = \alpha_0 + \alpha_1 Nonfamily\ Sphere\ Control + \alpha_2 Dual\ Class + \alpha_3 Board\ Size + \alpha_4 Board\ Independence + \alpha_5 Audit\ Committee + \alpha_6 Big\ 4\ Audited + \alpha_7 Firm\ Size + \alpha_8 Leverage + \alpha_9 ROA + \alpha_{10} MTB + \lambda Industry\ Controls + \lambda Year\ Controls + \varepsilon_{it}$$

(Eq.5)

8.4 Robustness checks and Propensity Score Matching

A prerequisite for being able to draw any conclusion from the results of this study is that the findings are robust. To control for the robustness of our results we will use a variety of robustness checks. Only results that are found significant using the main model will however be subject to these robustness checks. The different robustness checks are outlined in further detail below.

Different approaches to estimating earnings management

This study makes use of the Modified Jones Model for estimating discretionary accruals, motivated in chapter 6. While this model is customary in EM-research and widely regarded to be the one best suited for the estimation, there are multiple other models that can be used to estimate discretionary accruals. To account for the fact that our results might have been different if another estimation technique was used, we re-estimate our regressions using both the original Jones Model and the later developed Jones Cash Flow Model (see appendix 5 for details on how these differ from the Modified Jones Model).

Different threshold for control

As an additional robustness check, we modify the required level of voting power needed by the largest owner to be regarded as controlling, from 5 % to 20 %. This tests if our results hold when using a more restrictive definition of controlling ownership. The 20 % threshold was picked because of its prevalence in family ownership research (Isakov & Weisskopf, 2015; Villalonga & Amit, 2006).

Propensity Score Matching

The conclusions drawn from the regression methods used in the main model can be misleading due to endogeneity or self-selection bias.[9] Unlike ordinary least squares (OLS) methods, propensity score matching (PSM) is addressing the issue of self-selection bias and allows for a decomposition of treatment effects on outcomes (Titus, 2007). To see if the results differ from previous models, this study therefore uses a propensity score matching (PSM) approach (Dehejia & Wahba, 1999; Campello et al. 2010; Li, 2013). The key idea behind using PSM is to identify similar observations in a treatment group (e.g. sphere controlled) and a control group (e.g. non-sphere controlled). By doing so we are able to match identical or close to identical firms based on certain criteria that differ in regards to the treatment assignment, allowing us to estimate the effect of the treatment. In this study, firms from the two groups are matched on the variables *Firm Size* and *Industry,* creating a new sample of matched firms which is then used to run a new regression model. We match with replacement, using logit. According to Caliendo & Kopeinig (2008), PSM has three main advantages

[9] Self-selection bias refers to the introduction of errors due to systematic differences in characteristics within a sample.

compared to OLS regression models. The first advantage is that it ensures only observations with similar characteristics are subjected to comparison. The second advantage is that the method accounts for the fact that observations with different characteristics have different reactions to the treatment and, thereby, allows for heterogeneous treatment effects. The third advantage of PSM is that it is not relying on the assumption of unobserved variables being normally distributed like OLS does (Caliendo & Kopeinig, 2008).

9. Results and analysis

9.1 Sphere control and earnings management

Table 4 presents the results of the multivariate regression models used to test hypothesis 1 in this paper. Model 1 reports the results for the POLS model, using robust standard errors clustered by firm, controlling for industry and year effects. We can observe that for the main explanatory *Sphere Control (>5 %),* no statistically significant relationship with the dependent variable *ABS_MJM* was found. For the control variables we observe that *Dual Class* is weakly significant at the 10 % level with a coefficient of 0,402 implying that firms using a dual class share structure are associated with higher levels of EM. Furthermore, the variables, *Firm Size* and *MTB* are significant at the 5 % level with coefficients of -0,203 and 0,090 respectively.

The findings from Model 1 are, for the most part, in line with expectations. For the main explanatory variable in our study, *Sphere Control,* theory and previous empirical studies provides conflicting views regarding the direction of the relationship. From theory predicting an entrenchment effect, the suggestion would be that sphere controlled firms would engage in more EM. This view is supported by drawing on analogies from some empirical results on the relationship between family, institutional and concentrated ownership and EM (Chi et al. 2015; Ding et al. 2011; Bardhan et al. 2015; Fan & Wong, 2002; Bao & Lewellyn, 2017). Meanwhile, the alignment effect, socioemotional wealth theory, stewardship theory as well as the empirical results from Martin et al. (2016), Wang (2006), Tong (2007), Achleitner et al (2014), Mehrani et al. (2017), Velury and Jenkins (2006), Jung and Kwon (2002), Koh (2007), suggest an opposite relationship. Our results from Model 1 are more in line with the second view, showing a negative relationship between sphere ownership and EM. However, since the variable is not significant we do not find any support for the rejection of the null hypothesis (H_1). For the control variable *Dual Class,* we find that the relationship is the opposite of the results of Nguyen & Xu (2020) but in line with Francis et al. (2005). *Firm Size* is consistently shown to have a negative relationship with the prevalence of EM in previous research (Martin et al.

2016; Klein, 2002). Similarly, we find that a 1 % increase in *Firm Size* leads to a decrease in the level of EM by 0,002 percentage points. The relationship could possibly be explained by multiple factors, e.g. that larger firms have higher analyst coverage or better internal control systems. In accordance with the results found by Klein (2002) and Martin (2016), the variable *MTB* is associated with higher levels of EM. One explanatory mechanism for this could be that higher valued firms often have performed well in the past and therefore meet increasingly challenging earning targets, also known as the *treadmill effect* or *ratchet effect*. In order to meet these targets, managers might engage in more EM. For the remaining control variables - *Board Size, Board Independence, Audit Committee, Big 4 Audited, Leverage* and *ROA,* no significant relationship with the dependent variable was found and they will therefore not be commented on further here.

In Model 2 (table 4) we estimate the regression using random effects, controlling for industry effects, year effects and using robust standard errors clustered by firm. The absolute values of discretionary accruals estimated using the MJM (*ABS_MJM)* is used as the dependent variable. In this specification, the variable *Dual Class* is no longer statistically significant. *Firm Size* remains significant, in this regression on a 1 % level instead of a 5 % level. *MTB* loses significance in this specification whilst the variable *Leverage* is now weakly significant on the 10 % level. Interestingly, leverage shows the opposite relationship of previous research by Bassiouny et al. (2016) and Fanady et al. (2020). Furthermore, Model 2 similarly to Model 1, does not show a significant relationship between *Sphere Control* and EM. Both models therefore fail to reject the null hypothesis *(H_1)*. This means that we do not find any support for sphere ownership influencing the level of EM for Swedish firms.

Table 4. Regression results for Model 1-2.

	POLS	Random effects
	(1)	(2)
Dependent variable:	ABS_MJM (%)	ABS_MJM (%)
Sphere Control (>5 %)	-0.287	-0.087
	(0.248)	(0.229)
Dual Class	0.402*	0.274
	(0.225)	(0.194)
Board Size	-0.148	-0.006
	(0.093)	(0.071)
Board Independence	0.815	-0.019
	(0.700)	(0.461)
Audit Committee	-0.187	-0.178
	(0.263)	(0.205)
Big 4 Audited	-0.125	0.215
	(0.618)	(0.316)
Firm Size	-0.203**	-0.369***
	(0.098)	(0.103)
Leverage	-0.118	1.740*
	(0.804)	(1.005)
ROA	0.309	1.599
	(1.157)	(1.008)
MTB	0.090**	0.000
	(0.041)	(0.031)
Constant	7.407***	10.054***
	(2.491)	(2.429)
Observations	1,704	1,704
Standard errors	Clustered robust	Clustered robust
Industry effects	Yes	Yes
Year effects	Yes	Yes
R-squared	0.143	0.112
Number of firm clusters	243	243

Note: Table 4 compiles the results of the multivariate regressions performed with the objective of measuring the effect of the sphere ownership on earnings management. Model 1 reports the results for the POLS regression, using robust standard errors clustered by firm, controlling for industry and year effects. Model 2 reports the results for the regression using random effects, controlling for industry effects, year effects and robust standard errors clustered by firm. The dependent variable, **ABS_MJM,** is the absolute value of the estimated discretionary accruals using the Modified Jones Model. **Sphere Control** is a dummy variable equal to 1 if an ownership sphere is the largest owner and controls >5 % of votes in a firm, 0 otherwise. **Dual Class** is a dummy variable equal to 1 if the firm has more than one class of outstanding shares and 0 otherwise. **Board Size** is the number of directors on the board. **Board Independence** is the number of independent directors divided by the number of directors on a board. **Audit Committee** is a dummy variable equal to 1 if the firm has an audit committee and 0 otherwise. **Big 4 Audited** is a dummy variable equal to 1 if the firm is audited by PWC, EY, Deloitte or KPMG and 0 otherwise. **Firm Size** is the natural logarithm of a firm's total assets, **Leverage** is a firm's debt divided by total assets, **ROA** is a firm's return on assets calculated as net income divided by total assets. **MTB** is a firm's market-to-book ratio. All accounting variables are winsorized at the 1st and 99th percentiles.

Robust standard errors in parentheses.
**** p<0.01, ** p<0.05, * p<0.1*

9.2 Family and non-family spheres

Table 5 presents the results of the multivariate regressions used to test hypotheses 2 and 3. Model 3 reports the results for the POLS model, using robust standard errors clustered by firm, controlling for industry and year effects. Model 4 reports the results for the model using random effects, also controlling for industry effects, year effects and using robust standard errors clustered by firm. We can observe that for both models using *Family Sphere Control (>5 %)* as the main explanatory variable, there is a statistically significant negative relationship with the dependent variable *ABS_MJM*. In Model 3, the relationship is highly significant on a 1 % level with a coefficient of -0,639 and in Model 4 it is significant on a 5 % level with a coefficient of -0,401, implying that family-sphere controlled firms engage in less EM. More specifically, the coefficients indicate that firms controlled by family spheres are associated with 0,639 or 0,401 percentage points lower levels of estimated discretionary accruals than other firms. Our findings, therefore, are speaking in favour of a rejection of the null hypothesis (H_2), theoretically in line with the alignment effect, socioemotional wealth theory and stewardship theory. Prencipe et al. (2014) suggests that stewardship theory is more applicable in contexts where networks are shared, relationships are stable and there is significant independence. We argue that these criteria likely are more pronounced in family spheres than in non-family spheres. If this is the case, we should see less opportunistic managerial behaviour, and thereby EM in family-controlled firms. Gomez-Mejia et al. (2007) argues that family-controlled firms primarily optimise for retention of SEW rather than performance. Building on this, it is possible that EM should be less incentivised, and less common in family spheres. Empirically, the literature on family firms, which in this case is the most appropriate to draw analogies from, points in both directions. Our findings on family spheres are in line with the empirical results by Martin et al. (2016), Wang (2006), Tong (2007), Achleitner et al. (2014).

Model 5 reports the results for the POLS model while Model 6 reports the results for the model using random effects. These models are used to test the third hypothesis. We can observe that for both models with *Non-family Sphere Control (>5 %)* as the main explanatory variable, no statistically significant relationship with the dependent variable *ABS_MJM* was found. Therefore, we do not have sufficient evidence for a rejection of the null hypothesis (H_3).

For the control variables, we can observe that for Model 3 and 4, the variable *Dual Class* remains significant with a slight change in coefficients. For Model 5 and 6 the relationship between Dual Class and the dependent variable ABS_MJM is not significant. In Model 5, *Board Size* is negatively associated with the dependent variable on the 10 % level. *Firm Size* remained negatively associated with ABS_MJM in Model 3-6. This finding was highly significant in Model 3 and Model 5, and significant on a 5 % level when using random effects in Model 4 and Model 6. Further, we observe that the control variable *Leverage* is positively associated with earnings management in Model 4 and Model 6. This was also the case when using random effects in Model 2. *ROA* was positively associated with earnings management on the 10 % significance level in model 6. Finally, we observe that *MTB* was positively associated with ABS_MJM on the 5 % significance level, in line with Model 1.

Table 5. Regression results for Model 3-6

	POLS	Random effects	POLS	Random effects
	(3)	(4)	(5)	(6)
Dependent variable:	ABS_MJM (%)	ABS_MJM (%)	ABS_MJM (%)	ABS_MJM (%)
Family Sphere Control (>5 %)	-0.639***	-0.401**		
	(0.196)	(0.193)		
Non-family Sphere Control (>5 %)			1.140	0.720
			(0.802)	(0.528)
Dual Class	0.481**	0.339*	0.305	0.254
	(0.244)	(0.194)	(0.218)	(0.183)
Board Size	-0.133	-0.002	-0.163*	-0.018
	(0.085)	(0.071)	(0.085)	(0.071)
Board Independence	0.741	-0.037	0.779	-0.041
	(0.686)	(0.457)	(0.699)	(0.455)
Audit Committee	-0.235	-0.195	-0.101	-0.146
	(0.279)	(0.205)	(0.267)	(0.204)
Big 4 Audited	-0.111	0.216	-0.171	0.193
	(0.621)	(0.317)	(0.613)	(0.313)
Firm Size	-0.205**	-0.362***	-0.255**	-0.390***
	(0.101)	(0.103)	(0.102)	(0.105)
Leverage	-0.162	1.686*	-0.056	1.770*
	(0.804)	(1.005)	(0.800)	(1.001)
ROA	0.376	1.617	0.406	1.645*
	(1.155)	(1.008)	(1.156)	(0.998)
MTB	0.090**	-0.000	0.084**	-0.002
	(0.041)	(0.031)	(0.042)	(0.031)
Constant	7.030***	10.028***	8.420***	10.505***
	(2.083)	(2.402)	(2.584)	(2.469)
Observations	1,704	1,704	1,704	1,704
Standard errors	Clustered robust	Clustered robust	Clustered robust	Clustered robust
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R-squared	0.150	0.120	0.150	0.120
Number of firm clusters	243	243	243	243

Note: Table 5 compiles the results of the multivariate regressions performed with the objective of measuring the effect of the sphere ownership on earnings management divided into family and non-family spheres. Model 3 reports the results for the POLS regression estimating the relationship between family spheres and earnings management. Model 4 reports the results for the random effects regression estimating the relationship between family spheres and earnings management. Model 5 reports the results for the POLS regression estimating the relationship between non-family spheres and earnings management. Model 6 reports the results for the random effects regression estimating the relationship between non-family spheres and earnings management. All models are using robust standard errors clustered by firm to deal with the presence of heteroskedasticity and are controlling for industry and year effects. The dependent variable, **ABS_MJM,** is the absolute value of the estimated discretionary accruals using the Modified Jones Model. **Family Sphere Control** is a dummy variable equal to 1 if a family ownership sphere is the largest owner and controls >5 % of votes in a firm, 0 otherwise. **Non-family Sphere Control** is a dummy variable equal to 1 if a non-family ownership sphere is the largest owner and controls >5 % of votes in a firm, 0 otherwise. **Dual Class** is a dummy variable equal to 1 if the firm has more than one class of outstanding shares and 0 otherwise. **Board Size** is the number of directors on the board. **Board Independence** is the number of independent directors divided by the number of directors on a board. **Audit Committee** is a dummy variable equal to 1 if the firm has an audit committee and 0 otherwise. **Big 4 Audited** is a dummy variable equal to 1 if the firm is audited by PWC, EY, Deloitte or KPMG and 0 otherwise. **Firm Size** is the natural logarithm of a firm's total assets, **Leverage** is a firm's debt divided by total assets, **ROA** is a firm's return on assets calculated as net income divided by total assets. **MTB** is a firm's market-to-book ratio. All accounting variables are winsorized at the 1st and 99th percentiles.

Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

9.3 Robustness tests and Propensity Score Matching

Since we did not find sufficient evidence for a rejection of the null hypothesis regarding hypotheses 1 (H_1) and 3 (H_3), we are only re-estimating the model 3 and model 4 regressions. The results from the robustness regressions are presented in Table 6. Model 7 and 8 re-estimates the main model but instead of using the MJM it uses the original *Jones Model* to estimate discretionary accruals. Similarly, Model 9 and 10 re-estimates the main model but instead of using the MJM it uses the later developed *Jones Cash Flow Model* to estimate discretionary accruals. The two alternative discretionary accruals-estimation models are presented in Appendix X. From these controls we can observe that our results remain robust by looking at the variable *Family Sphere Control (> 5%)*. The coefficients for all models (7-10) are similar to that of Model 3 and 4, and still significant at the 1 % and 5 % level, respectively. Furthermore, in Model 11 and 12, we modify the required level of voting power needed by the largest owner to be regarded as controlling, from 5 % to 20 % and re-estimate our main model. For both specifications the coefficient changes slightly but the associations are still significant on the 5 % level. Model 13 shows the results of a POLS regression with the same parameter as Model 1, 3, 5, 7, 9 and 11. With this model we are assessing the robustness of our results by running a regression on the sample of firms that has been matched using PSM, described in chapter 8.4. We can observe that the *Treatment* variable is still significant at the 5 % level with a coefficient of -0,499. The results of our study can be considered robust, strengthening the validity of our finding that family-sphere controlled firms are associated with lower levels of EM.

Table 6. Robustness regression results for Model 7-13

	POLS	Random effects	POLS	Random effects	POLS	Random effects	PSM
	(7)	(8)	(9)	(10)	(11)	(12)	(13)
VARIABLES	ABS_JM	ABS_JM	ABS_JCM	ABS_JCM	ABS_MJM	ABS_MJM	ABS_MJM
Family Sphere Control (>5%)	-0.649***	-0.415**	-0.674***	-0.452**			
	(0.197)	(0.193)	(0.193)	(0.193)			
Family Sphere Control (>25%)					-0.545**	-0.440**	
					(0.218)	(0.177)	
Treatment (Family Sphere Control (>5%)							-0.499**
							(0.207)
Constant	7.152***	10.150***	7.194***	10.326***	7.027***	10.012***	6.216***
	(2.115)	(2.424)	(2.048)	(2.357)	(2.094)	(2.404)	(2.106)
Observations	1,704	1,704	1,704	1,704	1,704	1,704	906
Standard errors	Clustered robust	Clustered robust	Clustered robust	Clustered robust	Clustered robust	Clustered robust	Clustered robust
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.150	0.118	0.153	0.121	0.147	0.118	0.134
Number of firm clusters	243	243	243	243	243	243	200

Note: Table 6 compiles the results of the multivariate regressions performed with the objective of assessing the robustness of the result in Model 3 and 4. This is done by re-estimating the POLS regression and the random effects regression in the main model with two alternative methods for the estimation of EM, as well as changing the threshold limit for family sphere control and running a regression on the sample of matched firms using PSM. Model 7 and 8 reports the results for the regressions estimating the relationship between family spheres and EM using the absolute values of discretionary accruals estimated using the original **Jones Model (JM)**. Model 9 and 10 does the same thing except for discretionary accruals being estimated using the **Jones Cash Flow Model (JCM)**. In model 11 and 12, the **Modified Jones Model (MJM)** is used as the dependent variable, but the explanatory variable **Family Sphere Control** has a threshold of 20 % rather than 5 %. All models are using robust standard errors clustered by firm to deal with the presence of heteroskedasticity and are controlling for previously used control variables, industry and year effects. All accounting variables are winsorized at the 1st and 99th percentiles.

Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*

10. Conclusion

The purpose of this study was to investigate if earnings management is more or less prevalent in firms controlled by ownership spheres in the unique Swedish setting. Theory provides us with conflicting views on the relationship between Sphere ownership and EM. The entrenchment effect predicts that sphere ownership would be associated with higher levels of EM, while the alignment effect in combination with stewardship theory and socioemotional wealth theory predicts the opposite relationship, with sphere-controlled firms being associated with lower levels of EM. With previous empirical research providing evidence supporting both perspectives, this study set out to investigate the relationship between sphere ownership and earnings management, in the unique setting provided in Sweden. We did this by posing three open-ended hypotheses, hypothesising the influence ownership by spheres (hypothesis 1), family spheres (hypothesis 2) and non-family spheres (hypothesis 3) have on EM.

Using a sample of 1,704 observations for publicly listed firms on the Stockholm Stock Exchange (SSE Nasdaq OMX) during the period 2010-2020, the research question was approached empirically by estimating Pooled Ordinary Least Squares (POLS) and random effect regressions. The absolute values of discretionary accruals, estimated using the Modified Jones Model, were used as the dependent variable and customary variables in earnings management research were controlled for including industry and year effects. While the univariate analysis suggested a negative relationship between sphere-controlled firms and EM, the multivariate analysis showed that no significant relationship existed between the two. We therefore did not find sufficient evidence to reject the null hypothesis (H_1) of sphere ownership having an impact on levels of EM. We further explored possible connections between family sphere ownership and non-family sphere ownership and EM. Our results indicated that firms with family-spheres as the largest controlling owner are associated with lower levels of earnings management than other firms. The results remained robust to three robustness tests and propensity score matching. With these results our findings, similarly to

Martin et al. (2016) and Wang (2006), are more in line with the alignment effect, stewardship and socioemotional wealth theory.

We believe that our findings can contribute to additional insight on the topic of the effects of ownership structure on earnings management and by extension reporting quality. Furthermore, we believe that the subject of this study can be considered interesting for all stakeholders that in some way interact with financial reports. Understanding the underlying factors that facilitate or mitigate earnings management enables stakeholders, such as investors or creditors, to make better decisions. It could also allow for better and more effective legislation on behalf of regulatory authorities and increase trust in capital markets.

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Appendix

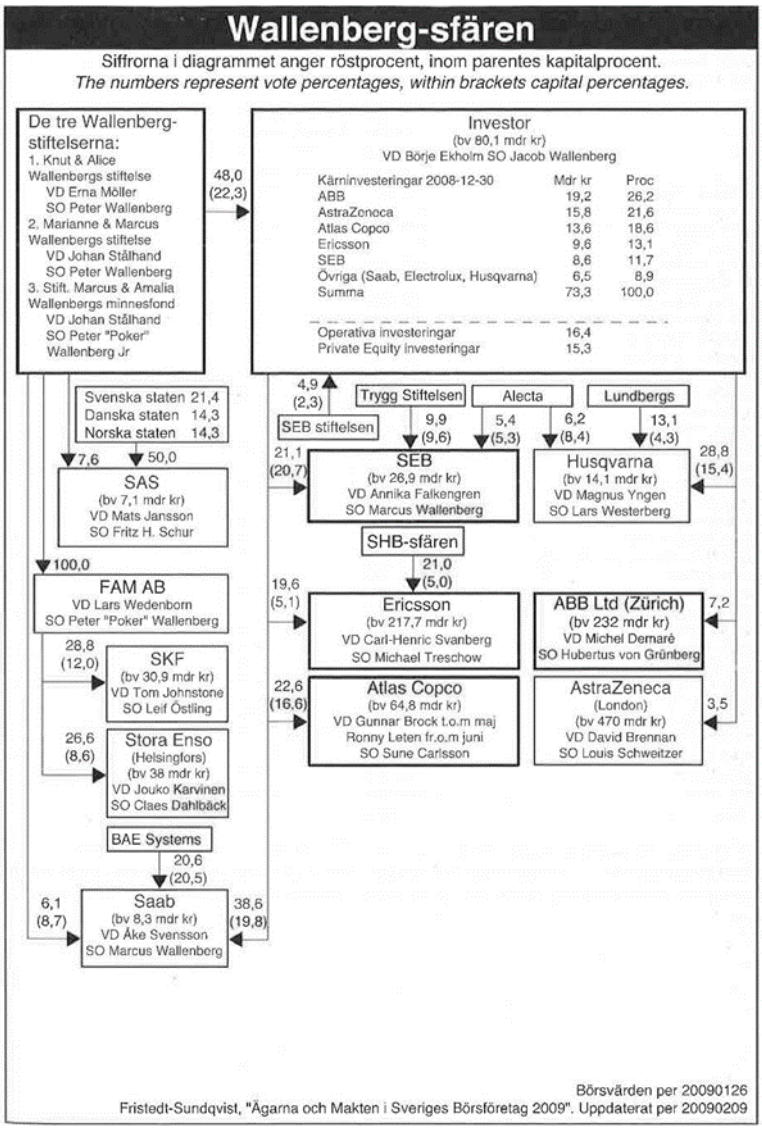
Appendix 1. White's test

White's test	H_0	Test statistic	P-value	Heteroskedsticity
Model 1	Homoskedasticity	737,27	0,000	Yes

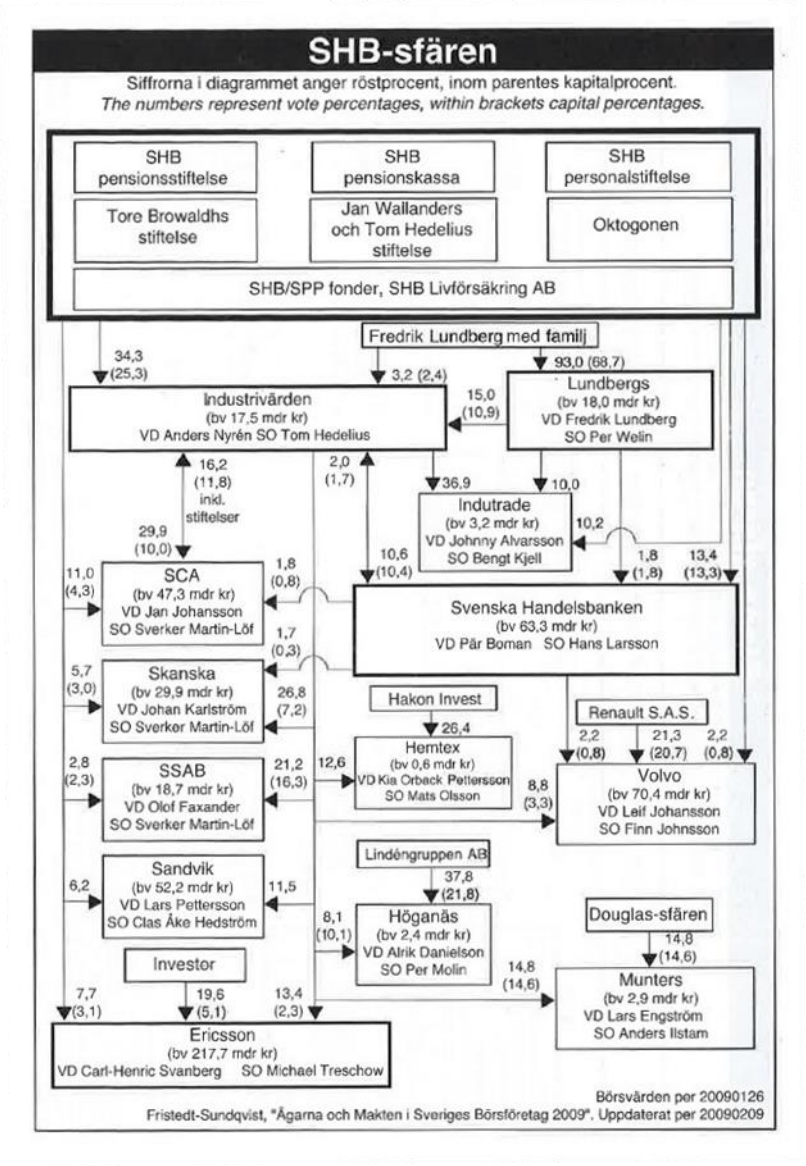
Appendix 2. Sphere List, provided by Holdings Modular Finance

Spheres	
Ax:son Johnson-sfären	Palmstierna-familjen
Bennet-sfären	Persson-sfären
Bergh-släkten	Persson-släkten
Björkman-familjen	Qviberg-intressen
Blomqvist-släkten	Qviberg-intressen
Claesson	Raysearch grundare
Danske Bank	Rejler-familjen
Douglas-sfären	Rosenblad-intressen
East Capital-sfären	Rutger Arnhult
Ehrnrooth-släkten	Salén-familjen
Erik Paulsson-familjen	Samhällsbyggnadsbolaget i Norden AB
Familjen Af Jochnick	Sampo-gruppen
Familjen Boström	SCA-sfären
Familjen Hamrin	Schörling-Sfären
Familjen Jorlén	SEB Fonder & Liv
Folke-släkten	SEB-sfären
Fraim-familjen	Sectras grundare
Fåhreus-intressen	Selin-intressen
Göran Lundin-familjen	SHB Fonder & Liv
Hagströmer-intressen	SHB-sfären
Haid-familjen	Stenbeck-sfären
Hamberg-familjen	Stillström-sfären
Hans Wallenstam med bolag och familj	Sundt-gruppen
Herlin-familjerna	Svedberg-släkten
Hielte & Hobohm-familjerna	Svedulf-familjen
Huaso-Holdings	Svenfelt-intressen
Jacobson-intressen	Svenska Staten
Jeansson-sfären	Swedbank-sfären
Johansson-intressen	Söderberg-sfären
Jonason-familjen	Tengberg-Werkell-sfären
Karinen-släkten	Tidstrand-familjen
Klingspor-släkten	Tigerschiöld-familjen
Lantbrukskooperationen	Tjernberg-Backman-familjerna
Ljungberg/Holmström-släkten	VBG-sfären
LMK-intressen	Wale-familjen
Lundberg-sfären	Wallenberg-sfären
Lundström-familjen	Wall-sfären
Länsförsäkringar	Ättlingar Heba
Martin-familjen	Örås-familjen
Mats Paulsson-familjen	Öster-släkten

Appendix 3. Wallenberg-sphere as of the 26th of January 2009 (Fristedt & Sundqvist, 2009).



Appendix 4. The Handelsbanken-sphere (or SHB-sphere) as of the 26th of January 2009 (Fristedt & Sundqvist, 2009).



Appendix 5. Alternative methods of estimating discretionary accruals.

Alternative method 1. The original Jones Model (1991).

$$\frac{TA_{it}}{Assets_{t-1}} = \alpha_0 \frac{1}{Assets_{t-1}} + \alpha_1 \frac{\Delta Sales_{it}}{Assets_{t-1}} + \alpha_2 \frac{PPE_{it}}{Assets_{t-1}} + \varepsilon_{it}$$

Alternative method 2. Jones Cash Flow Model (2004).

$$\frac{TA_{it}}{Assets_{t-1}} = \alpha_0 \frac{1}{Assets_{t-1}} + \alpha_1 \frac{(\Delta Sales_{it} - \Delta Receivables_{it})}{Assets_{t-1}} + \alpha_2 \frac{PPE_{it}}{Assets_{t-1}} + \alpha_3 \frac{\Delta CFO_{it}}{Assets_{t-1}} + \varepsilon_{it}$$