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Women on the board and their joint effect on accruals-based earnings management and real earnings management

Abstract

Much emphasis has been placed on the composition of women on the board lately. With Norway in the forefront, other countries within Europe have followed their path and implemented gender quotas on the board, and EU member countries are suggested to have 40 percent women on their boards by 2020. This study determines the effect gender-diverse boards has on accruals-based and real earnings management by comparing Norway and Sweden. The study also determines the effect independent women board members have on earnings management. Our samples consist of Norwegian and Swedish publicly listed companies, and the total number of observations amounts to 2165 from 2011 to 2018. After conducting several OLS-regressions we are able to conclude that both women board members and independent women board members have a decreasing effect on primarily accruals-based earnings management in Sweden, and only weak results are found for real earnings management in Sweden. Though, no conclusions can be drawn for the gender quota pioneer Norway, due to insignificant results.

Keywords: *accruals-based earnings management, real earnings management, board of directors, gender quota, women board members, independent women board members*

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Table of contents

1. INTRODUCTION 1

2. INSTITUTIONAL BACKGROUND 3

2.1 GENDER DEVELOPMENT WITHIN BOARDS IN NORWAY AND SWEDEN 3
2.2 CODES OF CORPORATE GOVERNANCE 4
2.2.1 Norwegian Public Limited Liability Act 2 4
2.2.2 Swedish guidelines 5

3. THEORETICAL SECTION AND HYPOTHESIS DEVELOPMENT 5

3.1 EARNINGS MANAGEMENT 5
3.1.1 Accruals-based earnings management 5
3.1.2 Real earnings management 6
3.2 GOVERNANCE MECHANISMS 7
3.2.1 Board of directors 7
3.2.2 Audit committee 7
3.3 INDEPENDENCE 8
3.4 GENDER 8
3.4.1 Gender-diverse boards 8
3.4.2 Gender characteristics 9

4. METHOD 10

4.1 SAMPLE SELECTION 10
4.2 COLLECTION OF DATA 11
4.3 RESEARCH DESIGN 12
4.3.1 Variables 12
4.3.2 Specification of the models 15
4.3.3 The Modified Jones model 15
4.3.4 Additional accruals-based measurement models 16
4.3.5 The real earnings management model developed by Roychowdhury 17
4.4 ENDOGENEITY ISSUE 18
4.5 INTERACTION TEST 18

5. EMPIRICAL RESULTS & DISCUSSION 19

5.1 NORWAY 19
5.2 SWEDEN 25
5.3 INTERACTION BETWEEN NORWAY AND SWEDEN 29
5.4 ADDITIONAL ROBUSTNESS TESTS 31

6. CONCLUSION, LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH 32

6.1 CONCLUSION 32
6.2 LIMITATIONS 33
6.3 FUTURE RESEARCH 33

REFERENCES 33

List of figure and tables

FIGURE 1, PERCENTAGE OF WOMEN ON THE BOARDS IN NORWAY AND SWEDEN 3

TABLE 1, OBSERVATIONS PER YEAR IN NORWAY 10
TABLE 2, OBSERVATIONS PER YEAR IN SWEDEN 10
TABLE 3, OBSERVATIONS PER SIC-GROUP IN NORWAY 11
TABLE 4, OBSERVATIONS PER SIC-GROUP IN SWEDEN 11
TABLE 5, SUMMARY OF EXPECTED SIGNS 14
TABLE 6, VARIABLES IN ACCRUALS-BASED EARNINGS MANAGEMENT MODELS 14
TABLE 7, VARIABLES IN REAL EARNINGS MANAGEMENT MODELS 14
TABLE 8, DESCRIPTIVE STATISCTICS FOR NORWAY 20
TABLE 9, PEARSON CORRELATION TEST FOR NORWAY 21
TABLE 10, OLS-REGRESSION FOR NORWAY 23
TABLE 11, OLS-REGRESSION FOR NORWAY 24
TABLE 12, DESCRIPTIVE STATISTICS FOR SWEDEN 25
TABLE 13, PEARSON CORRELATION TEST FOR SWEDEN 26
TABLE 14, OLS-REGRESSION FOR SWEDEN 28
TABLE 15, OLS-REGRESSION FOR SWEDEN 29
TABLE 16, INTERACTION TEST FOR NORWAY AND SWEDEN 30
TABLE 17, INTERACTION TEST FOR NORWAY AND SWEDEN 31

1. Introduction

The composition of the board of directors is one of the most prominent governance issues of corporations (Carter, Simkins & Simpson, 2003). Boards all over the world are pressured to select women board members (Adams & Ferreira, 2009), consequently, gender quotas on the boards are not an exception in developed economies anymore (Ahern & Dittmar, 2012). Hence, the composition of women on the boards has caught much attention lately (Matsa & Miller, 2013; Nielsen & Huse, 2010). The European Commission has suggested a quantitative objective for publicly listed companies in the European Union (EU), to have 40 percent women on their boards by 2020, as a consequence of women being underrepresented to a large extent when economic decisions are made (European Council, 2019). Although gender quotas have been seriously discussed in Sweden (Ahern & Dittmar, 2012; Seierstad & Huse, 2017), the proposed gender quota has been rejected by the Swedish parliament (Riksdagen, 2011). Some other countries within Europe have prior to the European Commission's suggestion implemented gender quotas on their boards (Joecks, Pull & Vetter, 2013; Seierstad & Huse, 2017). The pioneer Norway, obliged publicly listed companies to include at least 40 percent women on their boards by 2008 (Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Storvik, 2011), but still "*surprisingly little empirical evidence exists to justify these momentous changes*" (Srinidhi, Gul & Tsui, 2011, p.1610). On the one hand, the quota resulted in more gender-balanced boards in Norway, but on the other hand, it is uncertain if the quota resulted in increased equality beyond the boardroom (Seierstad & Huse, 2017).

A board of directors serves to protect shareholders' interests by monitoring management, hence it is able to constrain earnings management (Xie, Davidson & Dadalt, 2003). The decisions in the board can be influenced by independent board members, which have the capacity to detect and constrain earnings management (Osma, 2008). Board independence and gender diversity are strongly connected (Ferreira, 2015). Thus, the monitoring of managers can further be enhanced by a gender-diverse board (Adams & Ferreira, 2009; Lakhal, Aguir, Lakhal & Malek, 2015) and consequently enhance the detection of earnings management (Lakhal et al., 2015). This could be explained by the existing evidence that women board members are better at overseeing managers (Adams & Ferreira, 2009). Hence, independent women board members are more efficient monitors than both independent men board members and dependent women board members, since they are better at overseeing managerial behaviour (Benkraiem, Hamrouni, Lakhal & Toumi, 2017).

Since managers might have incentives to benefit their control of the firm at the expense of other stakeholders (Leuz, Nanda & Wysocki, 2003), they might make opportunistic decisions, e.g. conduct earnings management, in order to portray an improved performance of themselves (the Chief Executive Officer, CEO) or of the company (Al-Haddad & Whittington, 2019). For instance, at the same time as executives have incentives to increase the value of the firm, they also have incentives to cover or postpone poor performance to their investors (Srinidhi et al., 2011). Consequently, evidence exists that executives are taking part in earnings management, either accruals-based and/or real earnings management (Gao, Gao & Wang, 2017; Roychowdhury, 2006). During a long period of time, the use of accruals-based earnings management has increased, whilst the use of real earnings management has decreased (Cohen, Dey & Lys, 2008; Zang, 2012). But the reverse has occurred since the beginning of the 21st century (Cohen et al., 2008; Zang, 2012).

Previous researchers have investigated women on boards effect on earnings management (Einer, Marton, Samani & Söderqvist, 2016; Lakhal et al., 2015; Srinidhi et al., 2011), firm performance (Dale-Olsen, Schøne & Verner, 2013; Joecks et al., 2013) and firm value (Ahern & Dittmar, 2012; Carter et al., 2003). The majority of previously conducted studies investigate the effect voluntary implementation of gender diversity has had on boards (Damak, 2018). On the contrary, it also exists studies that have investigated the effect of

imperative gender quotas (see for example: Ahern & Dittmar, 2012; Einer et al., 2016; Lakhal et al., 2015). The views are though dispersed regarding what impact a quota has, which could be supported by Ferreira (2015, p.110) who concludes; "*current research does not really support a business case for board gender quotas. But it does not provide a case against quotas either*". For instance, some firms appear to increase their performance by selecting more women on their board, whilst other firms likely experience the opposite (Ferreira, 2015). Evidence shows that firms with greater gender-diverse boards, on average, perform worse than firms with less gender-diverse boards (Adams & Ferreira, 2009). Ferreira (2015) describes that it could be foreseen that a mandatory quota like the one in Norway would result in reduced profitability since it forced firms to select new women board members which likely were less qualified than the incumbent board members. Likewise, Ahern and Dittmar (2012) found a negative relationship between the Norwegian legislated gender quota and firm value. The reasoning behind the reduced firm value was according to Ahern and Dittmar (2012) that the gender quota resulted in younger board members with less experience of top positions. However, the literature provides conflicting meanings of what effect gender diversity on boards has on earnings management. For instance, Einer et al. (2016) found significant evidence that the legislated gender quota, which resulted in a higher percentage of women on boards in Norway, reduced the amount of accruals-based earnings management. On the contrary, no relationship was found between accruals-based earnings management and the percentage of women on the boards in Sweden, which supports the argument of the gender quota being an exogenous shock (Einer et al., 2016). A possible explanation to the differing effects between the two countries is the change of board composition in Norway with newly appointed independent outside board members as an outcome of the quota (Einer et al., 2016). Ahern and Dittmar (2012) also enlightens that the implementation of the gender quota in Norway, in addition to the change of gender, also led to new characteristics of the boards in Norway. For example, Ahern and Dittmar (2012) found evidence that newly appointed, exiting, or retained women board members in Norway are less likely insiders in comparison to exiting or retained board members that are men. Additionally, former evidence indicates that Norwegian firms which complied with the gender quota, increased their board independence (Bøhren & Staubo, 2016). Former evidence also implies that to be able to accurately monitor the behaviour of management, one should appoint women board members that are independent board members (Benkraiem et al., 2017), "*Consequently, simply imposing a quota for women on boards is an insufficient measure to enhance board decision-making*" (Benkraiem et al., 2017, p. 856). Therefore, it could be discussed if a reduction of earnings management is an outcome of newly appointed independent board members, a result of the increased fraction of women on the board, or a combined result of both, i.e. that more women board members are independent board members.

Previous studies on earnings management tend to focus on either accruals-based, or real earnings management. Even though, a greater amount of research has been made on accruals-based earnings management (Roychowdhury, 2006; Walker, 2013). Gao et al.'s (2017) finding indicate that solely focusing on one form of earnings management could create biased results. Particularly, if accruals-based earnings management and real earnings management are used as substitutes to each other by managers, but examined solely, it is not possible to reach definitive conclusions (Zang, 2012). This goes in line with Luo, Xiang and Huang (2017, p.142) who argue "*[…] analyzing only one earnings management strategy fails to capture the overall effect of board gender diversity*". Hence, we aim to determine what effect gender diversity on boards has on accruals-based and real earnings management, by comparing two countries with similar characteristics, but different ways of addressing gender diversity on the board. Namely, comparing Sweden where no gender quota exists, with the gender quota pioneer Norway. In line with prior research (Einer et al., 2016; Kyaw, Olugbode & Petracci, 2015; Lakhal et al., 2015), we hypothesize that women board members are able to decrease accruals-based earnings management. We also hypothesize that women on the boards have an effect on real earnings management, but sufficient evidence does not exist to justify any direction (Luo et al., 2017). Women on the board and independence have a joint effect and they are acting "*as a crucial corporate governance device*" (Benkraiem et al., 2017, p. 855). Hence, we also hypothesize that independent women board members

have a higher decreasing effect on earnings management. Our findings indicate that both women board members and independent women board members have a decreasing effect on primarily accruals-based earnings management in Sweden, and only weak results are found for real earnings management in Sweden. Though, no conclusions can be drawn for the gender quota pioneer Norway, due to insignificant results. As far as we know, this study is one of a few which has examined women on the boards' effect on both accruals-based and real earnings management. This study contributes to the literature of board gender diversity by strengthening prior research of women being able to constrain accruals-based earnings management (Einer et al., 2016; Kyaw et al., 2015; Lakhal et al., 2015). This study also enlightens the effect independent women board members have on earnings management, which contributes to Benkraiem et al.'s (2017) finding of especially independent women board members being efficient monitors.

The structure of this study is the following; the next section brings up the institutional background which is followed by the theoretical section and hypothesis development. Thereafter is the method of this study presented, which is followed by a section where the empirical results are presented and discussed. The study ends with a conclusion, presented limitations and suggestions for future research.

2. Institutional background

2.1 Gender development within boards in Norway and Sweden

It exists many similarities between Norway and Sweden (Seierstad & Huse, 2017), for instance, the legal systems are similar (Ahern & Dittmar, 2012). Another similarity between Norway and Sweden is the board structure and the gender equality (Matsa & Miller, 2013). However, Norway and Sweden address gender diversity on boards differently. This could be exemplified by the Swedish parliament's choice of rejecting the proposal to implement women quota on the boards (Riksdagen, 2011), whilst Norway made the opposite. Also, in 2016, the government in Sweden proposed a gender quota that would oblige Swedish public companies to have 40 percent women on their board by 2019 to avoid penalties (TT, 2017, 12 January). Due to lack of parliamentary support, the proposition was once again withdrawn (StyrelseAkademien, n.d.). The Norwegian imperative gender quota went into force during 2008 but was already passed in 2003 (Ahern & Dittmar, 2012; Bøhren & Staubo, 2014; Storvik, 2011). The gender quota obliged publicly listed Norwegian companies to include at least 40 percent of women on their boards (Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Storvik, 2011), and firms that refuse to comply with the law are punished with penalties (Bøhren & Staubo, 2014; Seierstad & Huse, 2017; Srinidhi et al., 2011). Since the beginning of the 21st century, changes have occurred in the boards in both countries. However, the change is more significant in Norway, which could be exemplified by the fact that public boards constituted of about 4% women in 2002, set in relation to 40% in 2009 when all public companies had complied with the quota (Storvik, 2011). In Sweden on the other hand, 6.1% of the board members of public listed companies were women in 2002 (AP2, 2018) and 19.1% were women in 2009 (AllBright, 2015). Today, the disparity between the two countries is reduced. Hence, in 2018, women on public boards amounted to 33.9% in Sweden (AP2, 2018), and 42.0% in Norway (SSB, 2020). In spite of the gender quota, several Norwegian publicly listed companies have avoided the imperative gender quota, by either switching from a public- to a private listed company or relocate to a foreign country (Ahern & Dittmar, 2012). For example, 30% more private companies existed in Norway in 2009, compared to in 2001 (Ahern & Dittmar, 2012).

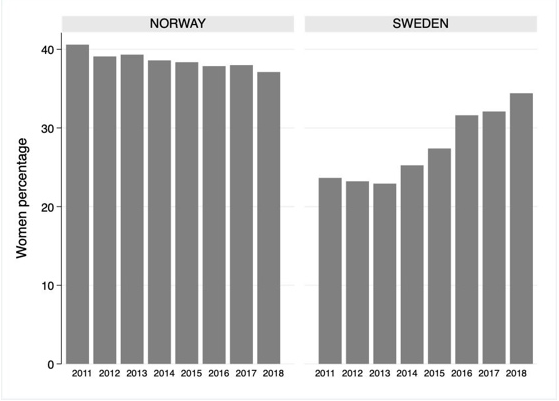

Figure 1, Percentage of women on the boards in Norway and Sweden

It can be deduced in *Figure 1* to the left, which is based on our manually collected data, that representation of women on the board has declined in Norway since 2011, whilst the opposite has occurred in Sweden. *Figure 1* is based on our final sample of 2165 observations from Norwegian and Swedish publicly listed companies (see *section 4.1* for more information).

2.2 Codes of Corporate Governance

The Swedish and the Norwegian Codes of Corporate Governance have a "*common Nordic approach*" and both are based on the general "*international development*" (Bolagsstyrning, 2009, p.6). Hence, many similarities exist, but in detail the codes differ from each other (Bolagsstyrning, 2009). According to the Norwegian and Swedish Code of Corporate Governance, at least half or the majority of the shareholder-elected board members should be independent of the company and its executive management (NUES, 2018; Swedish Corporate Governance Board, 2020), which is in line with international standards (Bolagsstyrning, 2009). Furthermore, at least two of the board members should be independent of the company's major shareholders, i.e. shareholders which controls at least 10% of the shares or votes in a company (NUES, 2018; Swedish Corporate Governance Board, 2020). In Swedish publicly listed companies, no more than one shareholder-elected board member is allowed to be part of the company's or the subsidiary's executive management (Swedish Corporate Governance Board, 2020), the CEO normally takes this place (Swedish Corporate Governance Board, 2020). Thus, the CEO of a Swedish public company is allowed to be a board member, but not to be the chairman of the board (Swedish Corporate Governance Board, 2020). In Norway on the other hand, executive management should not be part of the board (NUES, 2018). If a company in Norway deviates and includes executive personnel on the board, an explanation should be provided (NUES, 2018). Hence CEOs in Norwegian public companies are seldom members of the company's board of directors (Seierstad & Huse, 2017), and consequently the board members are dominantly or predominantly non-executive directors (Bolagsstyrning, 2009). It should also be mentioned that the employees are warranted to appoint a limited number of board members (Bolagsstyrning, 2009), called employee representatives. The board of directors should consist of a minimum of three board members in Sweden (Swedish Corporate Governance Board, 2020) and the same applies to Norway (Getting the deal through, 2019). Further on, larger Nordic listed companies have an audit committee which is a subcommittee that is established by the board (Bolagsstyrning, 2009). Since 2016, when the *EU Audit Reform*[1] came into effect, audit committees have strengthened their position on the board (StyrelseAkademien, 2018). For example, audit committees ought to have "*sector-relevant experience*" and one audit committee member at least, should have proficiency in accounting or auditing (KPMG, 2016).

2.2.1 Norwegian Public Limited Liability Act 2

According to the *Norwegian Public Limited Liability Act*, publicly listed companies should have the following representation of sexes on the Norwegian boards (Oslo Børs, 2014). The act states the following (Oslo Børs, 2014, p.465);

§ 6-11a. *Requirement regarding the representation of both sexes on the board of directors*

1. If the board of directors has two or three members, both sexes shall be represented.
2. If the board of directors has four or five members, each sex shall be represented by at least two members.
3. If the board of directors has six to eight members, each sex shall be represented by at least three members.
4. If the board of directors has nine members, each sex shall be represented by at least four members, and if the board of directors has more members, each sex shall represent at least 40% of the members of the board.
5. The rules in no. 1 to 4 apply correspondingly for elections of deputy members of the board of directors.

To summarize, the exact number of 40% representation of the least represented gender is applicable for boards which consist of more than nine board members whilst smaller boards instead follow a specified minimum number of board members for each gender (Bøhren & Staubo, 2016).

[1] The *EU Audit Reform* applies to member countries of the EU, as well as member countries of the European Economic Area (PwC, 2017).

2.2.2 Swedish guidelines

As already mentioned, Sweden has no gender quota on the board. But the *Swedish Corporate Governance Board* still aims to have an equal gender balance in Swedish public listed companies (Bolagsstyrning, 2014). In 2017, the least represented gender should have amounted to 35% according to the Swedish Corporate Governance Boards' guidelines (Bolagsstyrning, 2014). The new level of ambition is to have 40% of the underrepresented gender in Swedish public boards by 2020 (Bolagsstyrning, 2014).

3. Theoretical section and hypothesis development

3.1 Earnings management

Earnings management could be described in different ways. However, a well-known definition stated by Healy and Wahlen (1999, p.368) reads;

"*Earnings management occurs when managers use judgment 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 practices.*"

In short, earnings management could be described as managers' manipulation of a firm's true economic performance to mislead some stakeholders (Healy & Wahlen, 1999). Consequently, the earnings quality reduces as an effect of non-conforming information in the financial reports (Arun, Almahrog & Aribi, 2015). Incentives to misrepresent a firm's true performance, arise in part due to the conflict of interest between insiders (e.g. managers) and stakeholders (Leuz et al., 2003). As already mentioned, two forms of earnings management exist, *accruals-based earnings management* and *real earnings management* (Roychowdhury, 2006). The former has no direct effect on cash flows, whilst the latter has (Gao et al., 2017; Roychowdhury, 2006). Another difference between the two forms is the ease of detecting the manipulation. Hence the view is dispersed regarding which form of earnings management that tends to be the easiest to detect. Damak (2018) enlightens previous literature (see for example: Dechow, Sloan & Sweeney, 1995; Kothari, Leone & Wasley, 2005) which implies that managers conducting earnings management tend to manipulate their accruals, as a consequence of it being harder to discover. However, other studies argue for the opposite (Cohen et al., 2008; Roychowdhury, 2006; Sun, Lan & Liu, 2014). Additionally, Zang (2012) argues that there is a trade-off between the two forms of earnings management, as the choice of method is affected by the relative cost of the activities. For instance, when real activities manipulation is costlier than accruals-based earnings management, companies will be more engaged in the latter since it is less costly than the former (Zang, 2012).

3.1.1 Accruals-based earnings management

Accruals-based earnings management has been under substantial research compared to its contrasting method, real earnings management (Roychowdhury, 2006; Walker, 2013). According to Xie et al. (2003), accruals-based earnings management gives managers the discretion to determine actual earnings a firm is reporting in every period. For example, if actual earnings are right below the analysts' forecasted earnings, managers might be tempted to distort accruals to meet or beat these forecasts (Srinidhi et al., 2011). Hence, managers can manipulate earnings by practising their discretion on discretionary accruals (Arun et al., 2015). When discussing accruals-based earnings management, four different approaches are commonly mentioned; *Income smoothing, Income maximization, Income minimization,* and *Big bath accounting* (Caruso, Ferrari & Pisano, 2016).

Income smoothing

Income smoothing arises when managers use accruals to move cash flows between periods to show a more stable performance (Leuz et al., 2003). Graham, Harvey and Rajgopal (2005) describe that managers tend

to prefer to be involved in this form of accruals-based earnings management, hence believe that smoother earnings will enhance the prediction of future earnings and result in increased stock prices.

Income maximization and *Income minimization*
Income maximization is, just like the name indicates, about maximizing the potential income for the present year (Caruso et al., 2016). The other way around applies to the third approach, income minimization, and namely the aim of decreasing the year's profit to e.g. meet the expectations from the outside (Caruso et al., 2016). For example, a favourable outcome of income minimization is reduced taxes (Caruso et al., 2016).

Big bath accounting
Big bath accounting could be described as managers incentives to reduce poor performance even further if the earnings target is unachievable (Healy, 1985). In other words, it is a strategy where managers "*sacrifice a year*" in order to improve the chance of showing better performance the following year (Caruso et al., 2016, p.124).

3.1.2 Real earnings management
Roychowdhury (2006) is pointing out that prior studies indicate that financial executives are more willing to be involved in real earnings management rather than accruals-based earnings management. According to Roychowdhury (2006), there are at least two possible explanations for this statement. The first underlying reason is that accrual manipulation is more likely to be scrutinized by auditors and regulators than manipulation of real activities. The second possible reason is that solely relying on accruals-based earnings management is a risk (Roychowdhury, 2006). As already mentioned, real earnings management has a direct effect on cash-flows (Gao et al., 2017; Roychowdhury, 2006). For example, actions made in the current period to boost earnings might affect cash flows in a negative way in the future (Roychowdhury, 2006). According to Roychowdhury (2006, p.336) real earnings management is defined as;

"*management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds*".

When investigating real earnings management, it is difficult to detect the actual intention behind an investment or production decision, for instance whether a decision is made with the intention to maximize stock price or solely to manipulate earnings (Schipper, 1989). Roychowdhury (2006) is further pointing out that most evidence regarding real earnings management, has focused on detecting the reduction of discretionary expenditures. However, according to Roychowdhury (2006), the most prominent approaches of real earnings management are; *sales manipulation*, *overproduction* and *reduction of discretionary expenditures*.

Sales manipulation
Sales can be manipulated by temporarily boosting current year's sales by price discounts or by offering more gentle credit terms, i.e. sales manipulation (Roychowdhury, 2006). Price discounts are often used to boost sales hence lowering the margins, resulting in unusually high production costs in relation to sales (Roychowdhury, 2006). Furthermore, a firm can offer more gentle credit terms such as decreased interest rates towards the end of the fiscal year to boost sales volumes, which consequently decreases current year's cash inflow from operations (Roychowdhury, 2006). When the firm switches back to less gentle credit terms or their former higher prices, the increased sales volumes will probably disappear (Roychowdhury, 2006).

Overproduction
Firms are able to boost their operating margins by overproducing (Roychowdhury, 2006). Managers can therefore increase the production levels substantially, e.g. overproduce, to decrease the cost of goods sold

with the intention to report improved operating margins (Roychowdhury, 2006). As increased production levels result in decreased fixed costs per unit, the margins will increase as a result (Roychowdhury, 2006).

Reduction of discretionary expenses

Firms can reduce their discretionary expenditures, such as advertising expenses and R&D expenses, in order to decrease their reported expenses and increase their earnings, which might result in reduced cash flows in the future (Roychowdhury, 2006). Thus, decreasing discretionary expenditures leads to a reduction of cash outflows which has a positive effect on the current period's cash flows from operations (CFO) (Roychowdhury, 2006). Osma (2008) describes that managers are pressured to report earnings that are in line with certain goals. For instance, Graham et al. (2005) found strong evidence that most managers are willing to reduce discretionary expenses to meet set up earnings targets.

Cohen et al. (2008) describes that in relation to accruals-based earnings management, real earnings management tends to be more costly to shareholders. However, Roychowdhury (2006) claims that it is implausible that managers exclusively conduct accruals-based earnings management, regardless of the extended long-term costs real earnings management often creates for a firm. Some managers even tend to be willing to deviate from positive NPV projects to meet short-term targets (Graham et al., 2005). Consequently, some managers tend to be prone to harm the future value of the firm for achieving financial goals (Graham et al., 2005). However, Osma (2008) describes that real earnings management can be constrained by independent board members since they are efficient in monitoring this form of earnings manipulation, for instance capable of detecting opportunistic R&D cuts.

3.2 Governance mechanisms

3.2.1 Board of directors

Corporate governance could be described as an essential monitoring mechanism which certifies the quality of the financial reporting process (Al-haddad & Whittington, 2019). Hence, well working corporate governance protects the company's shareholders by guaranteeing that the company is run in an efficient, sustainable and responsible way (Bolagsstyrning, 2020). Good corporate governance helps to secure that the company creates future value for its shareholders (NUES, 2018). One of the governance mechanisms mentioned by Bushman and Smith (2001), is the board of directors. The main role of the board of directors is to advise management, hire executives that are responsible for running the firm's daily operations and approve the changes in corporate control (Matsa & Miller, 2013). The board of directors further works as a tool to control and monitor managers, hence mitigate existing agency problems between managers and shareholders (Adams & Ferreira, 2009; Carter et al., 2003). Therefore, the board of directors function as a corporate control mechanism (Al-haddad & Whittington, 2019; Bushman & Smith, 2001). Xie et al. (2003) enlightens that previous research has different views of what effect board size has on firms. Ambiguous opinions of which board size that is most proper to reduce earnings management exists (Rahman & Ali, 2006; Xie et al., 2003). On the one hand, a smaller board could be argued to take advantage of being more effective at monitoring and suffer to a lesser extent from bureaucratic problems (Rahman & Ali 2006; Xie et al., 2003). For instance, too large boards face the issue of having coordinational and processing problems (Rahman & Ali 2006). On the other hand, Xie et al. (2003) state that it is more likely that a larger board has independent board members as well as more experienced board members, which is in line with Xie et al's (2003) own finding which indicate that larger boards are more advantageous at reducing levels of earnings management.

3.2.2 Audit committee

Another monitoring mechanism within corporate governance is the audit committee, which is appointed by the board of directors (FAR Online, 2020b). The audit committee facilitates direct contact between the firm's auditor and the board of directors without engaging the management (FAR Online, 2020b). Thus,

the audit committee has regular meetings with the firm's auditor and ensures that there is an ongoing communication between the firm's outside auditor and the board of directors (Rahman & Ali 2006; Klein, 2002). The key role of an audit committee is to work as a monitoring function of the firm's financial reporting (Rahman & Ali, 2006; Klein, 2002; Sun et al., 2014; Srinidhi et al., 2011). Since the audit committee in relation to the board of directors is more capable to affect the firm's financial reporting, the audit committee is consequently more able to have an impact on earnings management (Chen, Cheng & Wang, 2015). Xie et al. (2003) describe that earnings management can be prevented by an active, well-functioning, and well-structured audit committee. Furthermore, members of the audit committee with corporate and financial background, should have an understanding of earnings management through their former experience (Xie et al., 2003). However, Sun et al. (2014) found no relationship between real earnings management and the audit committee's financial expertise. Instead, they found evidence that members of the audit committee who sit in multiple boards are less efficient monitors in constraining real earnings management (Sun et al., 2014). According to Sun et al. (2014, p.168), a potential reasoning behind is that these members might not have adequate time to find the necessary information needed to detect deviations from the firm's "*normal practice*" which is needed to be able to constrain earnings management, "*as real earnings management is opaque and hard to detect*".

3.3 Independence

Independent board members are fundamental monitors, and are able to limit managerial opportunism, hence they could be described as corporate governance mechanisms (Al-haddad & Whittington, 2019). Independent board members are also regarded as more objective, since they in relation to dependent board members are less affected by managers' impact (Chen et al., 2015). Publicly listed companies are obliged to include independent board members to ensure that the board of directors is acting in the firm's and the shareholders' best interest (FAR online, 2020a). Evidence exists that independent board members are able to constrain earnings management, thus a greater amount of independent board members is related to improved monitoring (Klein, 2002; Xie et al., 2003). However, Chen et al.'s (2015) finding imply that the effect board independence has on earnings management, depends on the cost of acquiring information. Hence, independent board members will have an increased monitoring efficiency in a rich informational environment (Chen et al., 2015). Nevertheless, according to Xie et al. (2003), independent board members' former experiences affects their ability to monitor. Thus, a board member with corporate or financial experience could be argued to have a better comprehension of earnings management and consequently be more efficient monitors in relation to board members without corporate or financial experience (Xie et al., 2003).

3.4 Gender

3.4.1 Gender-diverse boards

Gender diversity mitigates the conflict of interest between managers and shareholders since a more gender-diverse board tends to reduce agency problems, e.g. by preventing an individual or group to dominate the decision-making process (Lakhal et al., 2015). Additionally, Srinidhi et al. (2011) argue that female representation in boards could increase the earnings quality as an effect of increased control of the managers' reporting and lower the information asymmetry. Women also tend to be more cautious and have fewer incentives to make opportunistic decisions, compared to men (Lakhal et al., 2015). For example, heterogeneity might result in more vivid discussions and result in the emergence of more alternatives that are critically evaluated as well as compared to each other (Carter et al., 2003; Nielsen & Huse, 2010). Additionally, less similar board members tend to result in increased disagreements and more conflicts on the board (Adams & Ferreira, 2009). However, the actual effect women have on boards, depends according to the critical mass theory on the number of women, e.g. the critical mass (Konrad, Kramer & Erkut, 2008). According to Konrad et al. (2008), the minority gender (women) will be normalized as soon as the number of women board members is equal to three or more. Before the amount of three women board members is

reached, women, risk being seen as only a female representative, hence being isolated and distrusted, which disturbs the interactions within the board (Fan, Jiang, Zhang & Zhou, 2019; Konrad et al., 2008). Consequently, resulting in diminished quality of board monitoring (Fan et al., 2019).

3.4.2 Gender characteristics

Research indicates that women in general, are more risk-averse than men (see for example: Barber & Odean, 2001; Charness & Gneezy, 2012; Croson & Gneezy, 2009). Men, on the other hand, tend to perceive risky situations as stimulating challenges (Croson & Gneezy, 2009). One explanation to this fact is that women, in relation to men, are more emotional which tends to affect risky choices (Croson & Gneezy, 2009), whilst men usually have more overconfidence in these situations (Croson & Gneezy, 2009; Barber & Odean, 2001). However, it should be mentioned that the generalized differences of risk-taking between the genders is attenuated to managers, i.e. a smaller portion of women tend to choose managerial positions, however, women choosing these positions commonly have similar risk preferences, values and leadership styles as men (Croson & Gneezy, 2009; Nielsen & Huse, 2010). At the same time, Nielsen and Huse (2010) describe that the literature on gender-based differences claims that women and men's leadership behavior differs. Generally, men have more agentic characteristics than women, which implies that they are e.g. more aggressive, competitive, daring, individualistic, and self-confident (Nielsen & Huse, 2010). Additionally, Adams and Ferreira (2009) describe that women board members appear to have a similar effect on the board as independent board members. Furthermore, Bøhren and Staubo (2016) describe that more women board members are characterized as independent in relation to board members who are men. Hence, different views regarding gender characteristics exist. Luo et al. (2017, p.146) argue that "*[…] as female directors are more risk averse, less tolerant of opportunistic behavior and more active and better monitors than male directors, they can improve boards' total monitoring abilities and effectiveness*". Based on the formerly mentioned differences in characteristics between women and men, it could be argued that women are better monitors and less prone to conduct opportunistic decisions as earnings management. We find it accordingly interesting to identify if women on boards' effect is dispersed between the two forms of earnings management.

Consistent with prior findings (Einer et al., 2016; Kyaw et al., 2015; Lakhal et al., 2015) we hypothesize a negative relationship between women on the board and accruals-based earnings management, which leads us to the following hypothesis;

H1: *A higher proportion of women board members has a decreasing effect on accruals-based earnings management*

According to Luo et al. (2017) women board members are more capable of detecting real earnings management since they think more independently and are better monitors than men. Luo et al. (2017) analysed the relationship between real earnings management and the proportion of women on the board and found evidence that boards with a higher proportion of women conduct less real earnings management. Debnath, Pataikand and Satpathy (2019) hypothesized that the proportion of women on the board is associated with less real earnings management but found evidence of the opposite. Explanations of their finding was inter alia that women board members as a minority, might not be able or willing to decrease earnings management (Debnath et al., 2019). Another explanation, assuming that women board members are solely appointed to comply with gender the quota, they will not be successful in reducing real earnings management (Debnath et al., 2018). Hence, evidence speaks towards both directions. The possible effect women on the board has on real earnings management has though merely been studied by few (Luo et al., 2017), which makes this hypothesis more critical. Therefore, we hypothesize that women on the board will have an effect on real earnings management, but we do not have sufficient evidence to support any direction which leads us to the following hypothesis;

H2: ***A higher proportion of women board members has an effect on real earnings management***

Former evidence shows that independent board members are efficient monitors and are able to constrain earnings management (Osma, 2008). Klein (2002) found a negative relationship between accruals-based earnings management and independent board members. Further on, Osma (2008) found evidence that independent board members are able to constrain real earnings management. Adams and Ferreira (2009) describe that women board members tend to have a similar effect as independent board members. Additionally, Luo et al. (2017) describe that women board members in relation to board members who are men, are better monitors. Consequently, evidence exists that independent women board members, in relation to independent men board members and dependent women board members, are more efficient in overseeing managers' behaviour (Benkraiem et al., 2017). Further on, Arun et al. (2015) found evidence that independent women board members reduce earnings management. Hence, we hypothesize that independent women board members in relation to men, have a higher decreasing effect on earnings management, which leads us to the following hypothesis;

H3: Independent women board members has, in relation to men, a higher decreasing effect on accruals-based and real earnings management

4. Method

4.1 Sample selection

We are using data from publicly listed Norwegian companies on the Oslo Stock Exchange as well as data from publicly listed Swedish companies on OMX Stockholm. In order to have consistent samples, the downloaded financial data is converted from the currencies NOK and SEK to EUR. Only companies that have information about their total assets (an indication of the company's financial data being accessible or not) in the S&P Capital IQ database are included in the final sample. Further on, some observations are dropped since we are not able to find the annual report and therefore, cannot collect the manual data. Since earnings management tend to be complicated to measure in financial industries (Chen et al., 2015), financial-firms are excluded in our samples, which is in line with previously conducted research (see for example Chen et al., 2015; Cohen et al., 2008; Roychowdhury, 2006). Therefore, finance, insurance and real estate firms are excluded from the samples, in other words firms with industry SIC-codes between 60 and 67 are eliminated. In line with Kothari et al. (2005), some observations are dropped from the samples since they belong to a SIC-group with fewer than ten observations for each country and year. This resulted in the final number of six SIC-groups, four for Norway and five for Sweden (for more information about the industry classification see *Table 3* and *Table 4*). Further on, the final number of observations is 837 for Norway (see *Table 1*) and 1328 for Sweden (see *Table 2*). Lastly, we are using the time frame 2011 to 2018 to be able to capture the post-implementation effect of the gender quota.

Table 1, Observations per year in Norway

Year	Freq.	Percent	Cum.
2011	74	8.84	8.84
2012	83	9.92	18.76
2013	88	10.51	29.27
2014	100	11.95	41.22
2015	111	13.26	54.48
2016	123	14.70	69.18
2017	126	15.05	84.23
2018	132	15.77	100.00
Total	837	100.00	

Table 2, Observations per year in Sweden

Year	Freq.	Percent	Cum.
2011	156	11.75	11.75
2012	158	11.90	23.64
2013	168	12.65	36.30
2014	166	12.50	48.80
2015	162	12.20	60.99
2016	173	13.03	74.02
2017	183	13.78	87.80
2018	162	12.20	100.00
Total	1328	100.00	

Table 3, Observations per SIC-group in Norway

2-digit SIC-codes	Freq.	Percent	Cum.
Mining (10-14)	191	22.82	22.82
Manufacturing (20-39)	386	46.12	68.94
Transportation & Public Utilities (40-49)	187	22.34	91.28
Services (70-89)	73	8.72	100.00
Total	837	100.00	

Table 4, Observations per SIC-group in Sweden

2-digit SIC-codes	Freq.	Percent	Cum.
Manufacturing (20-39)	741	55.80	55.80
Transportation & Public Utilities (40-49)	30	2.26	58.06
Wholesale trade (50-51)	71	5.35	63.40
Retail trade (52-59)	118	8.89	72.29
Services (70-89)	368	27.71	100.00
Total	1328	100.00	

4.2 Collection of Data

The data is collected from annual reports which are accessed from the database S&P Capital IQ, or from the companies' websites. Following variables are collected manually from Norwegian and Swedish publicly listed companies; *the number of board members* (employee representatives are excluded), *number of women on the board*, *number of independent board members*, *number of dependent board members*, *number of independent women board members*, presence of *audit committee* and *CEO on the board*. We are excluding employee representatives from the sample since the shareholder-elected board members are more subject to the gender quota (Ahern & Dittmar, 2012). The variables; *number of board members*, *women on the board*, *audit committee* and *CEO on the board* are rather unproblematic to collect. However, the variables; *number of independent board members*, *number of dependent board members* and *number of independent women board members* are more complicated to identify and collect, especially for the Norwegian firms. This implies that the latter mentioned variables are facing the risk of being less reliable than the former mentioned variables. The reason behind is that the majority of the Swedish annual reports have a table of information that summarizes the information about the board in a clear way, which is not the case for the Norwegian firms where we in most cases have to read about the boards' composition and independence in the Corporate Governance report. One difficulty with the identification is to detect which of the board members that are dependent/independent and how the company defines independence. Some companies only depict that the company complies with the Code of Corporate Governance, whilst other companies provide a thorough description of each board members' affiliation towards the company and its shareholders. Based on the Codes of Corporate Governance in Norway and Sweden and in order to provide a consistent sample for both countries, we decide that a board member has to be both independent from the company, executive management and major shareholders to be regarded as independent. This implies that e.g. a board member that is independent of the company and executive management, but not from the major shareholders, is regarded as dependent. Further on, board members of a firm that solely write in their annual report that they comply with the Code of Corporate Governance, but do not provide any additional information about its board members are regarded as dependent in this study. This was the case in 386 of our Norwegian observations. The reason behind this choice is the difficulty of detecting if a board which consists of for example six board members and argue that they comply with the Code of Corporate Governance, has e.g. three or four independent board

members, since half or the majority of the shareholder-elected board members should be independent of the company and its executive management (NUES, 2018; Swedish Corporate Governance Board, 2020). However, we test for the reverse assumption, i.e. that all 386 observations where the board members were regarded as dependent, were changed to independent board members (see further information about this additional robustness test in *section 5.4*).

4.3 Research design

4.3.1 Variables

Our independent variables and our control variables are motivated and presented below, and the expected sign of the variables is presented in *Table 5*. Our variables of interest (our independent variables), percentage of women on the board and percentage of independent women board members, are firstly presented and thereafter are our control variables presented; percentage of independent board members, percentage of independent men board members, size of the board, CEO on the board, audit committee, leverage, market-to-book, size of the company and return on assets. The control variables are based on prior research (see for example: Chen et al., 2015; Kyaw et al., 2015; Lakhal et al., 2015).

Independent variables and control variables

Variables	Definition
Independent variables	
Women on the board (Wom_per)	The percentage of shareholder-elected women board members is measured by dividing the number of women board members (employee representatives are excluded) with Total_Board. Kyaw et al. (2015) found evidence that a higher percentage of women board members in Scandinavian boards is associated with a lower amount of accruals-based earnings management. Additionally, Lakhal et al.'s (2015) finding indicates a negative relationship between percentage of women on the board and accruals-based earnings management due to women being more efficient monitors. Therefore, we expect a negative correlation between percentage of women on the board and accruals-based earnings management. Further on, in line with our second hypothesis (H2) we predict that women board members will have an effect on real earnings management, but we do not have sufficient evidence to predict any direction.
Independent women board members (IndWom_per)	The percentage of independent shareholder-elected women board members is measured by dividing independent shareholder-elected women board members by Total_Board. Bøhren and Staubo (2016) found evidence that the fraction of women board members and board independence are associated. Since women board members appear to have a comparable effect as independent board members and are more independent from management than male directors (Adams & Ferreira, 2009), we expect a higher negative correlation between independent women board members and earnings management, compared to independent men board members.
Control variables	
Independent board members (Ind_per)	The percentage of independent shareholder-elected board members is measured by dividing independent shareholder-elected board members by Total_Board. Independent board members are deemed to improve corporate governance (Adams & Ferreira, 2009), hence they have the capacity to detect and constrain earnings management (Osma, 2008). In line with earlier research, Xie et al. (2003) found a negative correlation between percentage of independent board members and earnings management, which is a consequence of increased monitoring of the board. Therefore, we expect a negative correlation between independent board members and earnings management.
Independent men board members (IndMen_per)	The percentage of independent shareholder-elected men board members is measured by dividing the number of independent men board members by Total_Board. In line with our argumentation for independent board members, we

expect a negative association between independent men board members and earnings management.

Size of the board
(Total_Board)

Total number of shareholder-elected board members is used to represent the size of the board, i.e. employee representatives are excluded. On the one hand Rahman and Ali (2006) found a positive relationship between board size and earnings management. This finding supports the idea of larger boards being less efficient and having more bureaucratic problems (Rahman & Ali, 2006; Xie et al., 2003). On the other hand, indicate Xie et al.'s (2003) finding a negative correlation between board size and earnings management, due to larger boards having more independent board members with corporate or financial experience and are thus better at preventing earnings management. Hence the view is dispersed, and we expect the correlation between board size and earnings management to be either positive or negative.

CEO on the board
(CEO)

Dummy variable for CEO on the board. The dummy variable equals 1 if the firm's CEO is a board member, otherwise 0. Even if the CEO is not eligible to be the chairman of the board in Sweden (Swedish Corporate Governance Board, 2020), and should not be part of the board in accordance with Norwegian Code of Practice (NUES, 2018), we collected information about the CEO on the board since we expect it to have an effect on the board's monitoring. According to agency theory CEO duality, i.e. the CEO also serves as the chairman of the board, leads to less control and less efficient monitoring of the CEO (Peng, Zhang & Li, 2007). The CEO might be prone to affect governance practices and financial reports (Lakhal et al., 2015). Furthermore, CEO duality has a negative effect on corporate governance according to Dey, Engel and Liu (2011). We expect the CEO on the board to have a similar effect as CEO duality, therefore we expect a positive relationship between CEO on the board and earnings management.

Audit committee
(Audit_Comm)

Dummy variable for having an audit committee. If the firm has an audit committee the dummy variable equals 1, otherwise 0. Firms which state that their audit committee constitutes of the whole board are not considered having an audit committee, since the Norwegian Code of Corporate Governance stipulates that the whole board of directors should not act as the firm's audit committee (NUES, 2018). The same rule does not comply for Swedish firms (Finansinspektionen, 2020), but in order to be consistent, this approach was made. Since the key role of an audit committee is to work as a monitoring function (Rahman & Ali, 2006; Klein, 2002; Sun et al., 2014; Srinidhi et al., 2011), we expect a negative correlation between having an audit committee and earnings management.

Leverage
(Leverage)

Leverage is defined as Long-Term Debt divided by Total Assets. In line with previously conducted research, leverage represents the closeness of violation of debt covenants (Becker, Defond, Jiambalvo & Subramanyam, 1998; Chen et al., 2015). Hence, leverage is used to control for the existence of incentives to conduct earnings management in order to avoid debt covenant violations (Becker et al., 1998; Chen et al. 2015; Deangelo, Deangelo & Skinner, 1994). Thus, in line with Chen et al. (2015), we expect a positive correlation between earnings management and leverage.

Market-to-book
(Mtb)

Mtb is defined as Market Capitalization divided by Common Equity. In line with Chen et al. (2015), it is used in order to represent a firm's possible growth. Growing firms suffer more from missing earnings forecasts (Chen et al., 2015), and are consequently more prone to conduct earnings management (Meek, Rao & Skousen, 2007). We could thus expect a positive correlation between Mtb and earnings management (Chen et al., 2015; Meek et al., 2007).

Natural logarithm of Total Assets
(Size)

Lakhal et al. (2015) enlightens that it exists a relation between firm size and earnings management. However, the views are dispersed whether the relation between firm size and earnings management should be positive or negative. According to Chen et al. (2015), previous research implies that there should be a positive correlation between firm size and earnings management. Whilst Meek et al. (2007) argue that earnings management should be lower in large firms due to lower information

asymmetry and enhanced internal as well as external monitoring, thus there should be a negative correlation between firm size and earnings management. We thereof expect the correlation to be either positive or negative.

Return on assets (ROA)

ROA is in line with Chen et al. (2015) used to represent a firm's performance, since the firm's performance might incentivise managers to conduct earnings management. The likelihood to conduct earnings management will increase when a firm performs poorly, therefore the correlation between ROA and earnings management can be expected to be negative (Chen et al., 2015; Meek et al., 2007). However, other researchers argue for the opposite, that firms which performs well will be more engaged in earnings management to avoid losing the investors' confidence (Agrawal, Chatterjee & Kanjilal, 2015), hence we do also expect the correlation between ROA and earnings management to be positive.

Table 5, Summary of expected signs

Variables	Expected sign
Independent variables	
Wom_per	(+) or (-)
IndWom_per	(-)
Control variables	
Ind_per	(-)
IndMen_per	(-)
Total_Board	(+) or (-)
CEO	(+)
Audit_Comm	(-)
Leverage	(+)
Mtb	(+)
Size	(+) or (-)
ROA	(+) or (-)

The table above presents a summary of the expected directions of the previously presented variables, in relation to earnings management.

Table 6, Variables in accruals-based earnings management models

Variable	Definition
ca	Current assets
cash	Cash
cl	Current liabilities
std	Short term debt
dep	Depreciation, depletion and amortization
REV	Revenue
REC	Receivables
PPE	Property, plant and equipment
ta	Total assets
DA	Discretionary accruals
NDA	Non-discretionary accruals
TA	Total accruals
ROA	Return on assets
CFO	Cash flow from operations

Table 7, Variables in real earnings management models

Variable	Definition
CFO	Cash flow from operations
ta	Total assets
REV	Revenue
DISEXP	Discretionary expenses
COGS	Cost of goods sold
INV	Inventory
PROD	Production costs

4.3.2 Specification of the models

We use ordinary least square (OLS) regressions in order to analyse the data and test our hypotheses. In order to measure and detect accruals-based and real earnings management, a proxy is needed. Different models can be used to measure accruals-based earnings management. We have used the Modified Jones model (Dechow et al., 1995), as well as additional models suggested by Kothari et al. (2005) and McNichols (2002) to present more robust results. Additionally, when measuring real earnings management, we have used the measurement models developed by Roychowdhury (2006). The estimated proxies are our dependent variables in the regressions below (*Formula 1, Formula 2, Formula 3* and *Formula 4*). As can be seen in the formulas below, our variables of interest (women on the board and independent women board members) are separated in two different regressions due to high correlation between the variables (see *Table 9* and *Table 13*).

Accruals-based earnings management$_{it}$ [2] represents each of our estimated accruals-based earnings management proxies (ModifiedJones, Kothari and McNichols). When conducting the regression where Kothari is the dependent variable, ROA is not used as a control variable, since it is already used in the estimation of the Kothari proxy.

$$Accruals-based\ earnings\ management_{it} = \alpha + \alpha_1 WomPer_{it} + \alpha_2 IndPer_{it} + \alpha_3 TotalBoard_{it} + \alpha_4 CEO_{it} + \alpha_5 AuditComm_{it} + \alpha_6 Leverage_{it} + \alpha_7 Mtb_{it} + \alpha_8 Size_{it} + \alpha_9 ROA_{it} + \alpha_{10-15} Industry\ dummy_{it} + \alpha_{16-23} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 1

$$Accruals-based\ earnings\ management_{it} = \alpha + \alpha_1 IndWomPer_{it} + \alpha_2 IndMenPer_{it} + \alpha_3 TotalBoard_{it} + \alpha_4 CEO_{it} + \alpha_5 AuditComm_{it} + \alpha_6 Leverage_{it} + \alpha_7 Mtb_{it} + \alpha_8 Size_{it} + \alpha_9 ROA_{it} + \alpha_{10-15} Industry\ dummy_{it} + \alpha_{16-23} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 2

Real earnings management$_{it}$ represents each of our estimated real earnings management proxies for sales manipulation, overproduction and reduction of discretionary expenses. The accruals-based earnings management proxy, ModifiedJones, is added in the regressions as a control variable to test for the possible trade-off between real earnings management and accruals-based earnings management (Al-haddad & Whittington, 2019).

$$Real\ earnings\ management_{it} = \alpha + \alpha_1 WomPer_{it} + \alpha_2 IndPer_{it} + \alpha_3 TotalBoard_{it} + \alpha_4 CEO_{it} + \alpha_5 AuditComm_{it} + \alpha_6 Leverage_{it} + \alpha_7 Mtb_{it} + \alpha_8 Size_{it} + \alpha_9 ROA_{it} + \alpha_{10} ModifiedJones_{it} + \alpha_{11-16} Industry\ dummy_{it} + \alpha_{17-24} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 3

$$Real\ earnings\ management_{it} = \alpha + \alpha_1 IndWomPer_{it} + \alpha_2 IndMenPer_{it} + \alpha_3 TotalBoard_{it} + \alpha_4 CEO_{it} + \alpha_5 AuditComm_{it} + \alpha_6 Leverage_{it} + \alpha_7 Mtb_{it} + \alpha_8 Size_{it} + \alpha_9 ROA_{it} + \alpha_{10} ModifiedJones_{it} + \alpha_{11-16} Industry\ dummy_{it} + \alpha_{17-24} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 4

4.3.3 The Modified Jones model

The Modified Jones model is a widely used accruals-based measure of earnings management, which is based on the original Jones (1991) model. Unlike the original Jones (1991) Model, the Modified Jones model does not systematically misclassify non-discretionary and discretionary accruals (Bernard & Skinner, 1996). Bernard and Skinner (1996) concludes that the Modified Jones model is the most powerful, even though the model provides similar results as other accruals-based models. The Modified Jones model is used to separate total accruals into discretionary and non-discretionary accruals (Dechow et al, 1995). Hence, the

[2] Where *i* stands for firm and *t* stands for year in *it*

Modified Jones model takes into account that earnings management is easier to conduct on the recognition of revenue on credit sales than on the recognition of revenue on cash sales (Dechow et al., 1995). Thus, the Modified Jones model is assuming that earnings management is the underlying reason behind changes in credit sales (Dechow et al., 1995). By adjusting for changes in credit sales (ΔREV- ΔREC), the Modified Jones model mitigates the existence of Type II errors and the risk of not detecting present earnings management (Jackson, 2018). However, the Modified Jones model still face the issue of Type I errors and the risk of identifying earnings management even when it is not present (Jackson, 2018). Thus, it exists varied meanings of the usefulness of discretionary accruals models. Jackson (2018) also argues for discretionary accruals being an inappropriate proxy for earnings management, by stating that discretionary accruals only are deviations from the average within an industry. However, in order to control for variations across years and within industries, hence, to increase comparability (Becker et al., 1998), the regressions will be run industry-by-industry and year-by-year.

The Modified Jones Model in detail

The first step in the Modified Jones model is to compute Total Accruals which is done by using *Formula 5* below that includes; Δ of Current Assets, Δ of Current Cash, Δ of Current Liabilities, Δ of Short-term Debt and Depreciation & Amortization expenses.

$$TA_{it} = ((\, ca_{it} - ca_{it-1}\,) - (\, cash_{it} - cash_{it-1}\,)) \\ -((\, cl_{it} - cl_{it-1}\,) - (\, std_{it} - std_{it-1}\,)) - dep_{it}$$

Formula 5

After being estimated, Total Accruals is used as the dependent variable in the following formula, where the variables are divided by lagged total assets in order to reduce heteroscedasticity problems (Peasnell, Pope & Young, 2000).;

$$\frac{TA_{it}}{ta_{it-1}} = \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{(\Delta REV_{it} - \Delta REC_{it})}{ta_{it-1}}\right) + \alpha_3 \left(\frac{PPE_{it}}{ta_{it-1}}\right) + \varepsilon_{it}$$

Formula 6

Consequently, the error term (ε_{it}) in *Formula 6* represents the discretionary accruals, which is used as one of the proxies for accruals-based earnings management.

4.3.4 Additional accruals-based measurement models

To enhance the robustness of our results, the models suggested by Kothari et al. (2005) and McNichols (2002) are used as additional accruals-based measurement models.

Kothari et al. (2005) present a further modification of the Modified Jones model, by the inclusion of return on assets (ROA) as a proxy for performance. Kothari et al. (2005) argue that the sales change variable (ΔREV - ΔREC) in the Modified Jones model likely will produce a large estimated value of discretionary accruals when a firm has exceptional growth in the test period compared to the estimated period. ROA is thereof included in the model since discretionary accruals is significantly influenced by a firm's contemporary and prior performance, which mitigates the probability of the estimated discretionary accruals being systematically non-zero and leads to inaccurate conclusions about accrual behaviour (Kothari et al., 2005). However, also the model suggested by Kothari et al. (2005) have been criticised. For instance, Keung and Shih (2014) argue that inclusion of ROA as a measure of performance might result in earnings management being underestimated when performance is normal. Thus, the model is only appropriate when abnormal performance exists (Keung & Shih, 2014).

Formula 7 below is used to estimate the accruals-based earnings management measure suggested by Kothari et al. (2005), hence the error term is used as one of the proxies for accruals-based earnings management.

$$TA_{it} = \alpha + \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{\Delta REV_{it}}{ta_{it-1}}\right) + \alpha_3 \left(\frac{PPE_{it}}{ta_{it-1}}\right) + \alpha_4 ROA_{it-1} + \varepsilon_{it}$$

Formula 7

The accruals-based model suggested by McNichols (2002), combines the models suggested by Jones (1991), i.e. the original Jones (1991) model, and Dechow and Dichev (2002) (McNichols, 2002; Srinidhi et al., 2011). The model aims to strengthen and adjust for the errors that exist in the earlier mentioned models (McNichols, 2002). Therefore, takes lagged and future changes into account, which the original Jones (1991) model does not.

Formula 8 below is used to estimate the accruals-based earnings management measure suggested by McNichols (2002), thus also in this case the error term is used as one of the proxies for accruals-based earnings management.

$$\frac{TA_{it}}{ta_{it-1}} = \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{\Delta REV_{it}}{ta_{it-1}}\right) + \alpha_3 \left(\frac{PPE_{it}}{ta_{it-1}}\right) + \alpha_4 \left(\frac{CFO_{it-1}}{ta_{it-1}}\right) + \alpha_5 \left(\frac{CFO_{it}}{ta_{it-1}}\right) + \alpha_6 \left(\frac{CFO_{it+1}}{ta_{it-1}}\right) + \varepsilon_{it}$$

Formula 8

4.3.5 The real earnings management model developed by Roychowdhury

In line with earlier studies (see for example; Cohen et al., 2008; Cohen & Zarowin, 2010; Zang, 2012) we will use the models developed by Roychowdhury as proxies for real earnings management. Beyond the reduction of discretionary expenses, Roychowdhury (2006) also takes sales manipulation and overproduction into account (Roychowdhury, 2006). Roychowdhury (2006) investigates cash flows from operations (CFO), production costs and discretionary expenses to see patterns and detect real earnings management. A firm that conducts real earnings management is likely to have abnormally low cash flows from operations and/or abnormally high production costs and/or abnormally low discretionary expenses (Cohen et al., 2008; Cohen & Zarowin, 2010). Since a firm is likely to have at least one of the former mentioned abnormalities (Cohen et al., 2008, Cohen & Zarowin, 2010), we will use all three of Roychowdhury's (2006) manipulation methods in order to capture real earnings management. In line with Roychowdhury (2006) who follows Dechow et al. (1998), we will use the following three manipulation methods when measuring real earnings management; *sales manipulation (REM CFO), overproduction (REM Prod.)* and *reduction of discretionary expenses (REM Disc.Exp.)*. The mentioned real earnings management methods are calculated in line with the formulas below (*Formula 9*, *Formula 10* and *Formula 11*), which are based on Roychowdhury (2006). The error term from each real earnings management method below represents the respective real earnings management proxy (REM CFO, REM Prod. and REM Disc.Exp.).

$$\frac{CFO_{it}}{ta_{it-1}} = \alpha + \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{REV_{it}}{ta_{it-1}}\right) + \alpha_3 \left(\frac{\Delta REV_{it}}{ta_{it-1}}\right) + \varepsilon_{it}$$

Formula 9

$$\frac{PROD_{it}}{ta_{it-1}} = \alpha + \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{REV_{it}}{ta_{it-1}}\right) + \alpha_3 \left(\frac{\Delta REV_{it}}{ta_{it-1}}\right) + \alpha_4 \left(\frac{\Delta REV_{it-1}}{ta_{it-1}}\right) + \varepsilon_{it}$$

Formula 10

$$\frac{DISEXP_{it}}{ta_{it-1}} = \alpha + \alpha_1 \left(\frac{1}{ta_{it-1}}\right) + \alpha_2 \left(\frac{REV_{it-1}}{ta_{it-1}}\right) + \varepsilon_{it}$$

Formula 11

The regressions for all real earnings management models are run industry-by-industry and year-by-year, in line with Roychowdhury (2006). Since the directions of the estimated real earnings management proxies are interpreted in different ways, we are multiplying the residuals REM CFO and REM Disc.Exp. with -1, in order to ease the interpretation of our results since it enables us to interpret the directions for the accruals-based earnings management measures and the real earnings management measures in the same way.

4.4 Endogeneity issue

Adams and Ferreira (2009, p.295) enlightens that endogeneity issues appear when women's effect on corporate governance is studied due to "*omitted unobservable firm characteristics*". For instance, it is possible that some firms have both more women board members and better governance which could indicate an incorrect correlation between gender-diverse boards and governance variables (Adams & Ferreira, 2009). Luo et al. (2017) and Srinidhi et al. (2011) are also pointing out the issue of endogeneity by describing that firms which conduct less real earnings management, also might be more inclined to appoint women board members.

The imperative gender quota could be described as an exogenous shock in Norway, since all publicly listed companies were affected (Ahern & Dittmar, 2012; Bøhren & Staubo, 2016). Hence, this exogenous event is limiting the issues of endogeneity in Norway. However, Xie et al. (2003) describe that a large amount of the board literature is affected by the problem of endogeneity, which might be the case especially in our Swedish sample. Likewise, Srinidhi et al. (2011) describe that board governance has an "*endogenous nature*" (Srinidhi et al., 2011, p.1639). Therefore, we test if there is a problem of endogeneity by conducting the Durbin-Wu-Hausman test. The test indicated that a potential endogeneity problem might exist for one of our models in the Norwegian sample. Therefore, we also conduct a manual test for endogeneity, which indicated that no endogeneity problem exists for this model. In line with Adams and Ferreira (2009) and Srinidhi et al. (2011), we are likely facing the endogeneity issue *reverse causality* as well. Reverse causality is a common issue within accounting and corporate governance research and could be described as women board members being able to decrease earnings management, but it could also be the reverse, i.e. women choose to be a board member in firms which conduct less earnings management.

4.5 Interaction test

To be able to interpret if any differences exist between the Norwegian and the Swedish setting, we are conducting an interaction test where the Swedish and the Norwegian data sets are combined into the same regressions. Below formulas (*Formula 12, Formula 13, Formula 14* and *Formula 15*) present how the created interaction variables (Norway dummy, Norway_WomPer and Norway_IndWom_per) are included in our OLS-regression analysis. The results from the interaction tests are presented separately in *section 5.3*.

$$Accruals - based\ earnings\ management_{it} = \alpha + \alpha_1 WomPer_{it} + \alpha_2 IndPer_{it} + \alpha_3 Norway\ dummy_{it} + \alpha_4 Norway\_WomPer_{it} + \alpha_5 TotalBoard_{it} + \alpha_6 CEO_{it} + \alpha_7 AuditComm_{it} + \alpha_8 Leverage_{it} + \alpha_9 Mtb_{it} + \alpha_{10} Size_{it} + \alpha_{11} ROA_{it} + \alpha_{12-17} Industry\ dummy_{it} + \alpha_{18-25} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 12

$$Accruals - based\ earnings\ management_{it} = \alpha + \alpha_1 IndWomPer_{it} + \alpha_2 IndMenPer_{it} + \alpha_3 Norway\ dummy_{it} + \alpha_4 Norway\_IndWom\_per_{it} + \alpha_5 TotalBoard_{it} + \alpha_6 CEO_{it} + \alpha_7 AuditComm_{it} + \alpha_8 Leverage_{it} + \alpha_9 Mtb_{it} + \alpha_{10} Size_{it} + \alpha_{11} ROA_{it} + \alpha_{12-17} Industry\ dummy_{it} + \alpha_{18-25} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 13

$$Real\ earnings\ management_{it} = \alpha + \alpha_1 WomPer_{it} + \alpha_2 IndPer_{it} + \alpha_3 Norway\ dummy_{it} + \alpha_4 Norway\_WomPer_{it} + \alpha_5 TotalBoard_{it} + \alpha_6 CEO_{it} + \alpha_7 AuditComm_{it} + \alpha_8 Leverage_{it} + \alpha_9 Mtb_{it} + \alpha_{10} Size_{it} + \alpha_{11} ROA_{it} + \alpha_{12} ModifiedJones_{it} + \alpha_{13-18} Industry\ dummy_{it} + \alpha_{19-26} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 14

$$Real\ earnings\ management_{it} = \alpha + \alpha_1 IndWomPer_{it} + \alpha_2 IndMenPer_{it} + \alpha_3 Norway\ dummy_{it} + \alpha_4 Norway\_IndWom\_per_{it} + \alpha_5 TotalBoard_{it} + \alpha_6 CEO_{it} + \alpha_7 AuditComm_{it} + \alpha_8 Leverage_{it} + \alpha_9 Mtb_{it} + \alpha_{10} Size_{it} + \alpha_{11} ROA_{it} + \alpha_{12} ModifiedJones_{it} + \alpha_{13-18} Industry\ dummy_{it} + \alpha_{19-25} Year\ dummy_{it} + \varepsilon_{it}$$

Formula 15

5. Empirical results & Discussion

5.1 Norway

Table 8 below presents the summary of the descriptive statistics for Norway. The final Norwegian sample consists of a minimum of 547 observations and a maximum of 837 observations. As can be deduced below the mean values of the absolute discretionary accruals for the Modified Jones model, the Kothari model and the model suggested by McNichols are 10.8%, 10.3% and 16.2% of total assets respectively. Hence the three accruals-based models have quite similar means. It can also be deduced that the Min values for ModifiedJones, Kothari and McNichols are 0 or close to 0. In fact, the Min values for ModifiedJones and Kothari are not exactly 0, but they are rounded off to the nearest integer. The models used for detecting real earnings management indicate that abnormal levels of CFO, production costs and discretionary expenses have a mean of 0, which might seem odd. However, according to Al-haddad and Whittington (2019) mean proxies close to 0 indicates a fit between the real earnings management models and the data. Further on, the board size ranges between 2 and 10, and has a mean of about 5.2[3] board members. The mean percentage of women on the board amounts to 38.4%, which might be notable since the least represented sex should amount to at least 40% according to the quota. However, at the same time is the exact number of 40% only applicable for boards consisting of more than nine board members whilst smaller boards have a specific number of each gender to follow (Bøhren & Staubo, 2016). Hence, some boards have less than 40% women on the boards but are still complying with the quota (see *section 2.2.1*). Further on, 18.7% of the represented women board members are independent boards members, whilst the corresponding proportion is 18.2% for men. Overall, the Norwegian boards have on average 38.1% independent board members. The notably low mean percentage of independent board members and independent women/men board members in the Norwegian boards, might be a consequence of the assumptions made regarding board members dependence/independence that is described in *section 4.2*. Further on, 4.2% of the sample firms have a CEO on the board, which indicates that a majority of the sample firms are following the recommendations of not including executive personnel in the board (NUES, 2018). Additionally, 63% of the sample firms have an audit committee. The Norwegian sample has on average a Leverage of 18.8%, a Mtb of 0.97[3], a size in terms of total assets of 1909.9[3] million EUR and ROA of -4.3%[3].

[3] Rounding to one decimal

Table 8, Descriptive statistics for Norway

Variables	Obs	Mean	Std.Dev.	Min	Max
ModifiedJones	685	.108	.134	0	1.176
Kothari	685	.103	.125	0	1.147
McNichols	547	.162	.204	.001	1.841
REM CFO	685	0	.183	-1.035	1.134
REM Prod.	547	0	.135	-.549	.472
REM Disc.Exp.	547	0	.176	-1.35	.714
Wom_per	831	.384	.131	0	.75
IndWom_per	773	.187	.199	0	.6
Ind_per	836	.381	.385	0	1
IndMen_per	773	.182	.226	0	.889
Total_Board	837	5.152	1.278	2	10
CEO	837	.042	.2	0	1
Audit_Comm	837	.63	.483	0	1
Leverage	837	.188	.217	0	1.228
Mtb	837	.966	25.968	-733.851	42.429
Size	837	5.086	2.297	-2.589	11.711
Ta	837	1909.908	9428.831	.075	122000
ROA	837	-4.259	22.891	-363.557	38.481

Table 9, Pearson correlation test for Norway

Variables	Modified Jones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.	Wom_per	IndWom_ per	Ind_per	IndMen_ per	Total_ Board	CEO	Audit_ Comm	Leverage	Mtb	Size	ROA
ModifiedJones	1.000																
Kothari	0.915***	1.000															
McNichols	0.630***	0.674***	1.000														
REM CFO	0.009	-0.004	-0.041	1.000													
REM Prod.	0.023	0.025	0.057	0.236***	1.000												
REM Disc.Exp.	-0.125***	-0.059	0.019	-0.274***	0.291***	1.000											
Wom_per	-0.134***	-0.134***	-0.028	0.034	0.102**	0.026	1.000										
IndWom_per	-0.077*	-0.050	-0.010	0.011	-0.013	-0.055	0.332***	1.000									
Ind_per	-0.024	-0.006	0.001	0.014	-0.045	-0.072*	0.228***	0.916***	1.000								
IndMen_per	0.017	0.024	-0.012	0.023	-0.045	-0.061	0.101***	0.714***	0.935***	1.000							
Total_Board	-0.134***	-0.142***	-0.120***	0.037	-0.061	0.032	0.197***	0.166***	0.159***	0.133***	1.000						
CEO	0.109***	0.103***	0.153***	-0.026	0.047	-0.112***	-0.226***	-0.076**	-0.109***	-0.115***	-0.137***	1.000					
Audit_Comm	-0.110***	-0.094**	-0.035	0.122***	0.018	-0.064	0.327***	0.356***	0.300***	0.245***	0.337***	-0.112***	1.000				
Leverage	-0.077**	-0.076**	-0.003	0.008	-0.048	-0.046	-0.120***	-0.043	-0.032	-0.064*	-0.033	0.104***	0.092***	1.000			
Mtb	0.002	0.000	0.019	-0.004	-0.024	-0.029	-0.024	-0.043	-0.023	-0.001	0.025	0.005	0.040	-0.017	1.000		
Size	-0.151***	-0.132***	-0.043	-0.062*	0.020	0.088**	0.214***	0.118***	0.085**	0.009	0.351***	-0.221***	0.435***	0.409***	-0.004	1.000	
ROA	-0.193***	-0.105***	0.008	-0.329***	-0.135***	0.246***	0.185***	0.109***	0.078**	0.030	0.112***	-0.099***	0.265***	0.147***	-0.030	0.477***	1.000

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

In order to observe if there exist any significant correlations between our variables, we are conducting a Pearson correlation test for each country. Table 9 above presents our Pearson correlation test for Norway. It can be deduced that many correlations are significant, especially at the 1% significance level. Wom_per and Ind_per are significant at 1% and are 22.8% positively correlated. Wom_per is though more correlated with IndWom_per since the positive correlation amounts to 33.2% (significant at 1%). It can also be deduced that IndWom_per and IndMen_per have a strong positive correlation, since the correlation amounts to 71.4% (significant at 1%). Lastly, Wom_per and IndWom_per are positively correlated with Total_Board (significant at 1%) and the correlation amounts to 19.7% and 16.6% respectively.

We are also testing for multicollinearity in the datasets by conducting a Variance Inflation Factor (VIF) test, which is in agreement with earlier research (see for example Luo et al., 2017; Sun et al., 2014). The highest VIF-score of our variables in the Norwegian sample is 2.47. This indicates that no multicollinearity problems exist in our Norwegian dataset since all of our VIF-scores are under 4 and well below 10, which are values often used as a rule of thumb for multicollinearity (O'brien, 2007).

Table 10 and *Table 11* present the results from our OLS-regressions for Norway. Our main variables of interest are Wom_per and Ind_per in the first OLS-regression (*Table 10*). It can be deduced that Wom_per neither is significant in the accruals-based models, nor in the real earnings management models. Therefore, we are unable to say what effect women on the board has on earnings management in Norway. Not receiving a significant result for our accruals-based models deviates from Einer et al.'s (2016) significant finding of a negative relationship between women on the board and accruals-based earnings management in Norway. A potential reasoning behind our finding is that we used a different time frame. It can also be deduced in *Table 10* that Ind_per is insignificant in all models. Total_Board on the other hand is significant in four of the six models. Total_Board is significant at 5% in the Modified Jones model, Kothari model and McNichols model, and have a significance level of 10% in REM Prod. All of the coefficients are negative, hence indicating that larger boards tend to reduce earnings management and vice versa, which might be a result of larger boards having more independent board members with corporate or financial experience (Xie et al., 2003).

CEO on the board is significant at 5% and has a positive relationship with REM Prod., which is in line with our expectation, hence executive personnel on the board might increase the amount of real earnings management of production costs. We expected that CEO on the board will have a similar effect as CEO duality, hence a premise behind the increased level of real earnings management could be a reduction of control and monitoring of the CEO (Peng et al., 2007). It should be noted that only one out of three real earnings management models are significant, which questions the robustness of this result, but it might also imply that CEO on the board specifically are more prone to manipulate the firm's production, than any of the other real earnings management methods. However, we are not able to deduce if the intention behind the increase in production costs was in order to report an improved operating margin or not (Roychowdhury, 2006). The effect of an audit committee on real earnings management can be deduced to have ambiguous results, since REM CFO (significant at 1%) has a positive relation to Audit_Comm, which indicates that having an audit committee tend to increase the amount of real earnings management, whilst REM Disc. Exp. (significant at 10%) indicates the opposite. The diverse results could on the one hand indicate that the members of the audit committee sit in multiple boards, hence are less efficient monitors in constraining real earnings management (Sun et al., 2014). On the other hand, one can argue that the result from REM Disc.Exp. indicate that the audit committee is well-functioning and able to prevent the real earnings management activities in the form of reducing discretionary expenses. Mtb is positive and significant at 1% for the model suggested by McNichols which is in line with our expectation of a positive relationship. This result could be a consequence of growing firms being more prone to conduct earnings management when they are unable to meet the earnings forecasts (Chen et al., 2015; Meek et al., 2007). Size is also positive and significant at 5 %, but in REM Prod., which implies that larger firms, in terms of total assets, are more engaged in real earnings management and vice versa, which is consistent with prior research (Chen et al., 2015). ROA is significant at 1% in the real earnings management models REM CFO and REM Prod., significant at 5% in the accruals based ModifiedJones and at 10% in the real earnings management model REM Disc.Exp. According to the result from the ModifiedJones, REM CFO and REM Prod. firms with higher ROA are conducting less earnings management. The result might be explained by the fact that poor-performing firms are more likely to conduct earnings management (Chen et al., 2015; Meek et al., 2007). Whilst the positive relation between ROA and REM Disc.Exp. implies the opposite, simply that well-performing firms are more engaged in earnings management in order to avoid losing investors' confidence (Agrawal et al., 2015).

Table 10, OLS-regression for Norway

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
Wom_per	-0.0789	-0.0941	0.0181	-0.00216	0.151	0.0320
	(0.0719)	(0.0677)	(0.113)	(0.0681)	(0.0912)	(0.0836)
Ind_per	0.0102	0.0167	0.0180	-0.0270	-0.0142	-0.0194
	(0.0138)	(0.0127)	(0.0259)	(0.0307)	(0.0283)	(0.0359)
Total_Board	-0.0101**	-0.00978**	-0.0211**	-0.00236	-0.0152*	0.00670
	(0.00478)	(0.00423)	(0.00944)	(0.00919)	(0.00908)	(0.00990)
CEO	0.0371	0.0339	0.138	-0.0647	0.0654**	-0.0594
	(0.0543)	(0.0524)	(0.101)	(0.0490)	(0.0305)	(0.103)
Audit_Comm	-0.00722	-0.00665	0.00762	0.104***	0.00768	-0.0661*
	(0.0147)	(0.0137)	(0.0306)	(0.0308)	(0.0255)	(0.0346)
Leverage	-0.0803	-0.0714	-0.0768	0.00153	-0.0642	-0.0591
	(0.0554)	(0.0524)	(0.0909)	(0.0461)	(0.0403)	(0.0782)
Mtb	1.13e-05	3.34e-05	0.000269***	-0.000139	-0.000124	-7.07e-05
	(3.86e-05)	(5.02e-05)	(8.98e-05)	(8.42e-05)	(0.000105)	(0.000102)
Size	0.00336	-0.00112	0.000823	0.00277	0.0143**	0.000922
	(0.00485)	(0.00344)	(0.00819)	(0.00638)	(0.00696)	(0.00693)
ROA	-0.00130**		0.000373	-0.00456***	-0.00195***	0.00281*
	(0.000578)		(0.000635)	(0.00125)	(0.000689)	(0.00166)
ModifiedJones				-0.0528	-0.0225	-0.104
				(0.0926)	(0.0468)	(0.0663)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
SE clustered at firm level	YES	YES	YES	YES	YES	YES
Constant	0.197***	0.218***	0.267***	-0.0849	-0.0513	0.0572
	(0.0404)	(0.0371)	(0.0786)	(0.0646)	(0.0441)	(0.0716)
Observations	679	679	543	679	542	542
R-squared	0.105	0.078	0.071	0.183	0.078	0.106

Robust standard errors in parentheses (adjusted for clustering at firm level)
*** p<0.01, ** p<0.05, * p<0.1

In line with prior research (see for example Arthur, Tang & Lin, 2015; Caramanis & Lennox, 2008; Eliwa, Gregoriou & Paterson, 2019) all financial data are winsorized at the 1 and 99th percentiles to minimize the effect of extreme observations and outliers. The reasoning behind not winsorizing the manually collected data is due to the manually collected data being regarded as more reliable. We also clustered the standard errors at firm level to mitigate potential heteroskedasticity and correlations between the observations from the same firm.

The variables of interest in *Table 11* below are instead IndWom_per and IndMen_per. However, only IndMen_per is significant at 10% in the Kothari model. The positive relationship between IndMen_per and Kothari implies that firms with a higher percentage of independent men on the board conduct more accruals-based earnings management. However, since only one out of three accruals-based earnings management models are significant and the significance level is 10%, the robustness of this conclusion can be questioned. Total Board is still significant in the same four models as in *Table 10*, and the coefficients' direction is unchanged. In line with *Table 10*, CEO on the board is significant in REM Prod., and is also significant in McNichols. The level of significance is 10%, and the direction of the coefficients imply that the CEO on the board is related to increased earnings management which corresponds with our prediction. Audit_Comm is still significant at 1% in REM CFO and at 10% in REM Disc.Exp. in *Table 11*. Audit_comm is as well significant at 10% in the accruals-based models ModifiedJones and Kothari. The result is dubious since one of the models (REM CFO) indicates a positive relationship, whilst the other three models (REM Disc.Exp., ModifiedJones and Kothari) imply the opposite which is in line with our prediction and strengthens the evidence of audit committees being able to prevent earnings management (Chen et al.,

2015). Further on, Leverage is significant at 5% in REM Prod., and significant at 10% in ModifiedJones and Kothari. All coefficients are negative, hence indicating that firms with higher leverage are less involved in real earnings management and vice versa, which contradicts to our expectation of a positive relationship. The level of significance and the direction of the coefficients is the same for Mtb, Size and ROA in *Table 11* as in *Table 10*. Hence, these variables are interpreted in the same way as in the first OLS-regression for Norway (*Table 10*). Lastly, ModifiedJones is significant at 10% in REM Disc.Exp., and the sign of the coefficient indicates that when accruals-based earnings management (ModifiedJones) increases, real earnings management (REM Disc.Exp.) decreases and vice versa. This finding goes in line with Zang (2012) who is pointing out that firms trade-off the two different forms of earnings management. But, also in this case, the robustness of the result can be questioned since only one out of three real earnings management models is significant and the significance level is 10%.

Table 11, OLS-regression for Norway

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
IndWom_per	-0.0455	-0.0325	0.00981	-0.0491	0.0365	-0.0143
	(0.0365)	(0.0331)	(0.0615)	(0.0711)	(0.0714)	(0.0852)
IndMen_per	0.0586	0.0569*	0.0317	-0.0164	-0.0495	-0.0139
	(0.0399)	(0.0337)	(0.0545)	(0.0542)	(0.0568)	(0.0666)
Total_Board	-0.0111**	-0.0107**	-0.0223**	-0.00284	-0.0176*	0.00536
	(0.00503)	(0.00447)	(0.0102)	(0.00944)	(0.00964)	(0.00997)
CEO	0.0601	0.0575	0.153*	-0.0712	0.0457*	-0.0621
	(0.0542)	(0.0500)	(0.0873)	(0.0510)	(0.0266)	(0.0987)
Audit_Comm	-0.0255*	-0.0246*	-0.01000	0.118***	0.0162	-0.0739*
	(0.0144)	(0.0137)	(0.0302)	(0.0335)	(0.0264)	(0.0384)
Leverage	-0.0946*	-0.0838*	-0.135	0.00259	-0.0992**	-0.0968
	(0.0542)	(0.0494)	(0.0839)	(0.0506)	(0.0426)	(0.0895)
Mtb	4.47e-06	3.07e-05	0.000262***	-0.000142	-0.000128	-4.49e-05
	(4.02e-05)	(5.28e-05)	(8.44e-05)	(8.65e-05)	(0.000112)	(0.000108)
Size	0.00630	0.00142	0.00477	0.000756	0.0151**	0.00189
	(0.00513)	(0.00348)	(0.00824)	(0.00690)	(0.00761)	(0.00742)
ROA	-0.00130**		0.000430	-0.00453***	-0.00215***	0.00278*
	(0.000579)		(0.000641)	(0.00124)	(0.000682)	(0.00166)
ModifiedJones				-0.0359	-0.0299	-0.144*
				(0.105)	(0.0517)	(0.0743)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
SE clustered at firm level	YES	YES	YES	YES	YES	YES
Constant	0.177***	0.195***	0.292***	-0.0838	0.0115	0.0889
	(0.0301)	(0.0266)	(0.0653)	(0.0633)	(0.0406)	(0.0643)
Observations	631	631	501	631	502	502
R-squared	0.131	0.094	0.091	0.190	0.083	0.116

Robust standard errors in parentheses (adjusted for clustering at firm level)

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

In line with prior research (see for example Arthur et al., 2015; Caramanis & Lennox, 2008; Eliwa et al., 2019) all financial data are winsorized at the 1 and 99th percentiles to minimize the effect of extreme observations and outliers. The reasoning behind not winsorizing the manually collected data is due to the manually collected data being regarded as more reliable. We also clustered the standard errors at firm level to mitigate potential heteroskedasticity and correlations between the observations from the same firm.

5.2 Sweden

The descriptive statistics for Sweden are summarized and presented in *Table 12* below. It can be observed that the number of observations in the Swedish sample ranges between 847 and 1328, which makes the Swedish sample larger than the Norwegian sample. The accruals-based earnings management measures ModifiedJones, Kothari and McNichols have quite similar mean values; 7.9%, 7.9% and 10.6% of total assets respectively. Also, in the Swedish sample, the Min values for ModifiedJones, Kothari and McNichols are 0. As in the Norwegian sample, the Min values are not exactly 0, but they are rounded off to the nearest integer. The mean value for all of the real earnings management measures is equal to 0, which is in line with the Norwegian sample. As mentioned earlier, it indicates that the models fit the data quite well (Al-haddad & Whittington, 2019). It can further on be deduced that the board size in the Swedish sample varies between 3 and 13 board members, with a mean of approximately 6.6[3] board members. The mean percentage of women board members in the Swedish sample (27.7%) is lower than the Norwegian sample (38.4%), which is not remarkable since no gender quota exists in Sweden. Furthermore, the mean percentage of independent women board members (24.6%) is almost half of the mean percentage of independent men board members (43.5%). Hence, the mean percentage of independent board members reaches 67.7% in the Swedish sample, which is a much higher mean than in the Norwegian sample (38.1%). We argue that the reason behind the large spread between the countries is due to the previously stated difficulties in identifying the dependent/independent board members in the Norwegian sample (see *section 4.2*). Since, we were not facing the same difficulties in the Swedish sample, we consequently argue for the Swedish sample's mean of independent board members to be more reliable than the ones in the Norwegian sample. Observing the CEO-dummy, it indicates that the CEO is a part of the board in 35.5% of the Swedish sample firms. Further on, 73.6% of the boards in the Swedish sample have an audit committee. Lastly, on average, firms included in the Swedish sample have a leverage of 12.1%, a Mtb of -3.3[3], size in terms of total assets of 1468.0[3] million EUR, and ROA of 3.8%[3].

Table 12, Descriptive statistics for Sweden

Variables	Obs	Mean	Std.Dev.	Min	Max
ModifiedJones	1084	.079	.165	0	3.308
Kothari	1081	.079	.159	0	3.098
McNichols	848	.106	.145	0	1.875
REM CFO	1084	0	.139	-.752	.734
REM Prod.	847	0	.212	-1.635	.782
REM Disc.Exp.	847	0	.204	-.976	.769
Wom_per	1327	.277	.138	0	.8
IndWom_per	1233	.246	.138	0	.667
Ind_per	1322	.677	.196	0	1
IndMen_per	1231	.435	.186	0	1
Total_Board	1328	6.602	1.437	3	13
CEO	1328	.355	.479	0	1
Audit_Comm	1314	.736	.441	0	1
Leverage	1328	.121	.14	0	1.161
Mtb	1328	-3.273	133.96	-3825.228	229.026
Size	1328	5.365	1.946	.322	10.68
Ta	1328	1467.963	4143.847	1.38	43473.7
ROA	1322	3.768	10.872	-92.968	67.531

Table 13, Pearson correlation test for Sweden

Variables	Modified Jones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.	Wom_per	IndWom_ per	Ind_per	IndMen_ per	Total_ Board	CEO	Audit_ Comm	Leverage	Mtb	Size	ROA
ModifiedJones	1.000																
Kothari	0.967***	1.000															
McNichols	0.461***	0.480***	1.000														
REM CFO	0.075**	0.067**	0.211***	1.000													
REM Prod.	-0.024	-0.047	-0.077*	0.368***	1.000												
REM Disc.Exp.	-0.028	-0.041	-0.138***	-0.224***	0.564***	1.000											
Wom_per	-0.046	-0.036	-0.103***	-0.107***	-0.029	0.068**	1.000										
IndWom_per	-0.066**	-0.062**	-0.120***	-0.143***	0.000	0.130***	0.882***	1.000									
Ind_per	0.006	0.006	-0.005	-0.146***	-0.029	0.099***	0.218***	0.416***	1.000								
IndMen_per	0.035	0.031	0.077**	-0.047	-0.017	0.040	-0.410***	-0.305***	0.739***	1.000							
Total_Board	-0.092***	-0.100***	-0.073**	-0.029	0.065*	0.135***	0.103***	0.042	-0.096***	-0.154***	1.000						
CEO	-0.108***	-0.118***	-0.109***	-0.028	0.087**	0.076**	-0.062**	-0.101***	-0.296***	-0.262***	0.375***	1.000					
Audit_Comm	-0.017	-0.028	-0.044	0.005	0.010	0.048	0.132***	0.141***	0.074***	-0.037	0.326***	0.117***	1.000				
Leverage	-0.050*	-0.052*	-0.034	0.053*	0.068**	0.029	0.094***	0.078***	-0.050*	-0.103***	0.215***	0.095***	0.166***	1.000			
Mtb	0.012	0.016	-0.038	0.039	0.024	-0.011	-0.038	-0.051*	-0.079***	-0.048*	-0.023	0.035	-0.030	-0.197***	1.000		
Size	-0.105***	-0.114***	-0.182***	-0.031	0.060*	0.106***	0.213***	0.144***	-0.104***	-0.231***	0.643***	0.349***	0.338***	0.433***	-0.049*	1.000	
ROA	-0.085***	-0.075**	-0.283***	-0.599***	-0.283***	0.061*	0.176***	0.174***	0.007	-0.130***	0.105***	0.030	0.008	0.021	-0.058**	0.269***	1.000

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

In the Pearson Correlation test above (*Table 13*) it can be deduced that several of the variables in the Swedish sample are correlated, which is in line with our Norwegian sample. The variables Wom_per and IndWom_per are significant at 1% and have a strong correlation of 88.2%. Ind_per and IndWom_per are positively correlated as well, and the correlation amounts to 41.6% (significant at 1%). Lastly, Ind_per and IndMen_per are significant at 1% and have a strong positive correlation of 73.9%. The strong correlation, especially between Wom_per and IndWom_per in the Swedish sample, is the main reason behind separating the four variables (Wom_per and Ind_per from IndWom_per and IndMen_per) into two different OLS regressions. By separating Wom_per and IndWom_per into two different regressions, we are mitigating the issue of multicollinearity. Also, in the Swedish sample Wom_per is positively correlated with Total_Board (significant at 1%) and the correlation amounts to 10.3%, however unlike in the Norwegian sample, IndWom_per and Total_Board are insignificant in the Swedish sample.

In line with the Norwegian sample, we are conducting a VIF test in order to further test for multicollinearity in the Swedish sample. The highest VIF-score of our variables is 2.57, thus indicating that no multicollinearity problems exist in our Swedish dataset as well.

Observing the first OLS-regression analysis (*Table 14*) for Sweden, it is possible to deduce that the relation between Wom_per and the discretionary accruals from ModifiedJones and Kothari are negative and significant at 5% level. The negative relation between the mentioned variables implies that if the percentage of women increases, the level of discretionary accruals decreases, when all other variables being constant. This negative relationship is in line with previous research (Einer et al., 2016; Kyaw et al., 2015; Lakhal et al., 2015) which indicates that women board members are efficient monitors and are able to reduce accruals-based earnings management. Moreover, this is as well the relationship we hypothesized for (H1). However, all real earnings management models were insignificant for Wom_per. Therefore, based on the Swedish sample we are neither able to reject nor accept the second hypothesis (H2).

The variable which captures the effect independent board members (Ind_per) have on earnings management, is significant at 1% for REM CFO and at 5% for ModifiedJones, Kothari and REM Disc.Exp. The significant negative relationships between Ind_per and the accruals-based earnings management measures (ModifiedJones and Kothari), imply that the levels of earnings management decreases when the percentage of independent board members increases and vice versa. This is the relation we expected for accruals-based earnings management and is also in line with previous research (Klein, 2002), hence indicating that independent board members are more efficient monitors and are consequently able to constrain accruals-based earnings management (Klein, 2002; Xie et al., 2003). The negative relation between Ind_per and REM CFO also indicates that independent board members are able to constrain real earnings management. However, the positive relation between Ind_per and REM Disc.Exp. implies the opposite, which contradicts to Osma's (2008) finding. Thus, we are neither able to conclude that independent board members have an increasing nor decreasing effect on real earnings management.

In *Table 14* below, it can also be observed that CEO is significant at 1% in the Modified Jones model, Kothari model and the McNichols model, and significant at 5% in the REM CFO model. The significant result shows that when the CEO is a part of the board, less earnings management is conducted, which contradicts to our expectation. Further on, Mtb is negative and significant at 1% in the McNichols model, which contradicts to our predicted direction. However, we cannot argue for the result to be robust, since only one out of six models are significant. In *Table 14* it can furthermore be deduced that Size is significant at 5% in McNichols and at 1% in REM CFO. The negative relationship in the McNichols model implies that the larger the firm is, the less accruals-based earnings management can be expected, whilst the positive relationship in the REM CFO instead implies that more real earnings management can be expected. Lastly, ROA is significant at 1% in McNichols, REM CFO, and REM Prod., and at 5% in ModifiedJones, which indicates that the better a firm performs (higher ROA), the less earnings management can be expected. This result is further strengthening the evidence of poor-performing firms being more likely to conduct earnings management (Chen et al., 2015; Meek et al., 2007).

Table 14, OLS-regression for Sweden

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
Wom_per	-0.0578**	-0.0578**	-0.0447	-0.0250	0.0161	0.0712
	(0.0283)	(0.0265)	(0.0383)	(0.0359)	(0.0930)	(0.113)
Ind_per	-0.0407**	-0.0488**	-0.0318	-0.115***	0.0357	0.156**
	(0.0206)	(0.0199)	(0.0256)	(0.0292)	(0.0781)	(0.0756)
Total_Board	-0.000903	0.000421	0.00786	-0.00537	0.00254	0.0142
	(0.00365)	(0.00362)	(0.00543)	(0.00449)	(0.0105)	(0.0101)
CEO	-0.0330***	-0.0336***	-0.0316***	-0.0313**	0.0309	0.0356
	(0.00980)	(0.00919)	(0.0112)	(0.0154)	(0.0311)	(0.0343)
Audit_Comm	-0.00203	-0.00207	-0.00389	-0.00516	-0.0116	-0.000574
	(0.0123)	(0.0114)	(0.0141)	(0.0120)	(0.0295)	(0.0374)
Leverage	-0.0230	-0.0115	0.00244	0.00440	0.0317	0.000633
	(0.0289)	(0.0267)	(0.0367)	(0.0354)	(0.0858)	(0.0858)
Mtb	-2.72e-07	1.07e-05	-5.09e-05***	-6.01e-06	1.55e-05	8.19e-06
	(8.24e-06)	(8.08e-06)	(9.67e-06)	(7.95e-06)	(1.71e-05)	(1.70e-05)
Size	-0.00125	-0.00501	-0.00891**	0.0151***	0.0107	0.00427
	(0.00303)	(0.00305)	(0.00449)	(0.00574)	(0.00916)	(0.0117)
ROA	-0.00133**		-0.00338***	-0.00837***	-0.00641***	0.000601
	(0.000601)		(0.00116)	(0.000762)	(0.00199)	(0.00183)
ModifedJones				0.0153	-0.0466	-0.0273
				(0.0183)	(0.0552)	(0.0476)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
SE clustered at firm level	YES	YES	YES	YES	YES	YES
Constant	0.134***	0.142***	0.185***	0.0657**	-0.0988	-0.254***
	(0.0311)	(0.0294)	(0.0340)	(0.0290)	(0.0927)	(0.0908)
Observations	1,061	1,062	836	1,061	826	826
R-squared	0.079	0.088	0.120	0.421	0.100	0.050

Robust standard errors in parentheses (adjusted for clustering at firm level)

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

In line with prior research (see for example Arthur et al., 2015; Caramanis & Lennox, 2008; Eliwa et al., 2019) all financial data are winsorized at the 1 and 99th percentiles to minimize the effect of extreme observations and outliers. The reasoning behind not winsorizing the manually collected data is due to the manually collected data being regarded as more reliable. We also clustered the standard errors at firm level to mitigate potential heteroskedasticity and correlations between the observations from the same firm.

Over to the second OLS-regression analysis for Sweden (*Table 15*). In *Table 15* it is possible to observe that the variable IndWom_per is significant for each model except for REM Prod. The level of significance for the Modified Jones model, Kothari model and REM CFO is 1%, whilst the corresponding level is 5% for McNichols and REM Disc.Exp. The direction on all of the coefficients, except for REM Disc.Exp., indicate that earnings management decreases when the percentage of independent women board members increases. The positive relationship between REM Disc.Exp. and IndWom_per might be explained by Sun et al. (2014, p.168) who describe real earnings management as "*opaque*" and "*hard to detect*". Furthermore, it can be deduced that the relations between IndMen_per and ModifiedJones (5%), Kothari (5%), REM CFO (1%) and REM Disc.Exp. (10%) are significant. The significant negative relation between the first three mentioned earnings management measures and IndMen_per implies that the higher the percentage of independent men in the boards is, the lower the amount of earnings management is. However, the lastly mentioned earnings management measure REM Disc.Exp., has a positive relation with IndMen_per, which indicates the reverse. It can also be deduced in *Table 15*, that the coefficients are higher for IndWom_per compared to IndMen_per in all models that are significant for both variables. This is in line with our third hypothesis (H3). Which might imply that independent women board members are able to constrain earnings management to a higher extent than independent men board members and could be described by independent women board members being more efficient in overseeing managers' behaviour than

independent men board members (Benkraiem et al., 2017). The remaining variables (CEO, Mtb, Size, ROA) that were significant in *Table 14*, are still significant in *Table 15* for the same models and the coefficients have the same direction. Hence, the relations can be interpreted in the same way as in *Table 14*.

Table 15, OLS-regression for Sweden

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
IndWom_per	-0.101***	-0.118***	-0.0887**	-0.138***	0.0909	0.265**
	(0.0314)	(0.0270)	(0.0360)	(0.0401)	(0.113)	(0.110)
IndMen_per	-0.0436**	-0.0442**	-0.0240	-0.120***	0.0182	0.141*
	(0.0209)	(0.0200)	(0.0279)	(0.0325)	(0.0824)	(0.0830)
Total_Board	-0.00204	-0.000269	0.00698	-0.00669	-0.00211	0.0103
	(0.00332)	(0.00327)	(0.00496)	(0.00473)	(0.0108)	(0.0104)
CEO	-0.0281***	-0.0289***	-0.0272**	-0.0330**	0.0245	0.0307
	(0.00885)	(0.00818)	(0.0116)	(0.0161)	(0.0319)	(0.0361)
Audit_Comm	-0.00151	-0.00113	-0.00516	-0.000520	-0.00562	-0.00492
	(0.0129)	(0.0116)	(0.0141)	(0.0124)	(0.0296)	(0.0369)
Leverage	-0.0332	-0.0146	0.00219	0.00117	-0.0111	-0.0315
	(0.0298)	(0.0268)	(0.0410)	(0.0388)	(0.0901)	(0.0918)
Mtb	-5.72e-06	6.21e-06	-5.08e-05***	-5.49e-06	8.29e-06	1.50e-06
	(5.94e-06)	(5.35e-06)	(1.01e-05)	(8.21e-06)	(1.78e-05)	(1.79e-05)
Size	-0.00182	-0.00483	-0.00874*	0.0162***	0.0131	0.00560
	(0.00309)	(0.00307)	(0.00463)	(0.00603)	(0.00944)	(0.0121)
ROA	-0.00122*		-0.00300**	-0.00827***	-0.00661***	0.000328
	(0.000622)		(0.00125)	(0.000765)	(0.00207)	(0.00191)
ModifiedJones				0.00548	-0.0414	-0.0184
				(0.0300)	(0.0540)	(0.0453)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
SE clustered at firm level	YES	YES	YES	YES	YES	YES
Constant	0.149***	0.146***	0.189***	0.0677**	-0.0765	-0.224**
	(0.0227)	(0.0216)	(0.0334)	(0.0305)	(0.0932)	(0.0898)
Observations	1,004	1,004	792	1,004	789	789
R-squared	0.084	0.090	0.124	0.419	0.104	0.051

Robust standard errors in parentheses (adjusted for clustering at firm level)
*** p<0.01, ** p<0.05, * p<0.1

In line with prior research (see for example Arthur et al., 2015; Caramanis & Lennox, 2008; Eliwa et al., 2019) all financial data are winsorized at the 1 and 99th percentiles to minimize the effect of extreme observations and outliers. The reasoning behind not winsorizing the manually collected data is due to the manually collected data being regarded as more reliable. We also clustered the standard errors at firm level to mitigate potential heteroskedasticity and correlations between the observations from the same firm.

5.3 Interaction between Norway and Sweden

In *Table 16* and *Table 17*, the result from the interaction test for Norway and Sweden can be observed. As can be deduced in *Table 16* and *Table 17*, the interaction variables (Norway, Norway_WomPer and Norway_IndWom_per) are significant in some of the models. It can be observed that the interaction variable Norway_WomPer is positive and significant (5%) in REM CFO and negative and significant (5%) in REM Disc.Exp. (*Table 16*). Whilst Norway_IndWom_per is positive and significant (1%) in REM CFO, negative and significant (1%) in REM Disc.Exp. as well as positive and significant (10%) in Kothari (*Table 17*). The significant and positive relationships of the interaction variables can be interpreted as the effect of Wom_per and IndWom_per on earnings management being more positive in Norway, thus implying that the positive effect of Wom_per and IndWom_per is stronger in Norway than in Sweden. The interpretation

is the reverse when the relationship is significant and negative on the interaction variables, i.e. that the negative effect of Wom_per and IndWom_per on earnings management is stronger in Norway than in Sweden. This implies that the effect of women board members and independent women board members differs between Norway and Sweden. However, as mentioned earlier, we did not receive any significant results for our variables of interest in Norway in our previously conducted OLS-regressions (*Table 10* and *Table 11*), thus these interaction results are not able to strengthen our Norwegian results.

Table 16, Interaction test for Norway and Sweden

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
Wom_per	-0.0504	-0.0664**	-0.0615*	-0.0898***	0.0223	0.159**
	(0.0341)	(0.0323)	(0.0348)	(0.0298)	(0.0605)	(0.0711)
Ind_per	-0.00324	-0.00359	-0.0155	-0.0399**	-0.0144	0.00270
	(0.0121)	(0.0118)	(0.0178)	(0.0158)	(0.0178)	(0.0212)
Norway	0.0174	0.0455	-0.0185	-0.109***	-0.0592	0.229***
	(0.0325)	(0.0313)	(0.0460)	(0.0282)	(0.0383)	(0.0384)
Norway_ WomPer	-0.0418	-0.0668	0.0513	0.159**	0.0527	-0.182**
	(0.0742)	(0.0713)	(0.107)	(0.0620)	(0.0918)	(0.0924)
Total_Board	-0.00501*	-0.00143	-0.00547	-0.00422	-0.00345	0.0125***
	(0.00291)	(0.00303)	(0.00510)	(0.00346)	(0.00441)	(0.00466)
CEO	-0.0236***	-0.0209**	-0.0177	-0.0308***	0.0323**	0.0261
	(0.00894)	(0.00863)	(0.0138)	(0.00929)	(0.0138)	(0.0160)
Audit_Comm	9.16e-06	-0.00261	0.00836	0.0427***	0.00810	-0.0240
	(0.00935)	(0.00893)	(0.0132)	(0.00969)	(0.0137)	(0.0166)
Leverage	-0.0571*	-0.0445	-0.0533	0.00468	-0.0161	-0.0288
	(0.0298)	(0.0285)	(0.0583)	(0.0232)	(0.0264)	(0.0396)
Mtb	-1.72e-05**	-7.03e-06	-2.55e-05	6.85e-06	9.18e-07	-1.90e-05*
	(8.66e-06)	(1.06e-05)	(1.72e-05)	(7.83e-06)	(9.13e-06)	(1.12e-05)
Size	0.00154	-0.00489**	-0.00513	0.0129***	0.0186***	0.0102***
	(0.00246)	(0.00221)	(0.00467)	(0.00303)	(0.00325)	(0.00367)
ROA	-0.00170***		-0.00172**	-0.00604***	-0.00450***	0.00141
	(0.000394)		(0.000673)	(0.000818)	(0.000560)	(0.000958)
ModifiedJones				0.00494	-0.0282	-0.109**
				(0.0307)	(0.0398)	(0.0485)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Constant	0.173***	0.168***	0.288***	-0.0128	-0.0689*	-0.280***
	(0.0266)	(0.0256)	(0.0395)	(0.0293)	(0.0368)	(0.0432)
Observations	1,740	1,741	1,379	1,740	1,368	1,368
R-squared	0.085	0.076	0.078	0.253	0.091	0.108

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

Table 17, Interaction test for Norway and Sweden

VARIABLES	ModifiedJones	Kothari	McNichols	REM CFO	REM Prod.	REM Disc.Exp.
IndWom_per	-0.0687**	-0.0883***	-0.0894***	-0.181***	0.0329	0.262***
	(0.0305)	(0.0287)	(0.0321)	(0.0313)	(0.0610)	(0.0642)
IndMen_per	-0.00601	0.000539	-0.0168	-0.0851***	-0.0260	0.0544
	(0.0203)	(0.0201)	(0.0275)	(0.0242)	(0.0352)	(0.0375)
Norway	-0.0206	-0.00304	-0.0244	-0.128***	-0.0467	0.272***
	(0.0189)	(0.0189)	(0.0272)	(0.0228)	(0.0326)	(0.0363)
Norway_ IndWom_per	0.0639	0.0705*	0.0852	0.239***	-0.0319	-0.374***
	(0.0432)	(0.0426)	(0.0648)	(0.0535)	(0.0819)	(0.0880)
Total_Board	-0.00629**	-0.00223	-0.00658	-0.00494	-0.00736	0.00986**
	(0.00288)	(0.00303)	(0.00525)	(0.00364)	(0.00447)	(0.00469)
CEO	-0.0178**	-0.0136	-0.0144	-0.0387***	0.0245*	0.0287*
	(0.00872)	(0.00843)	(0.0146)	(0.0102)	(0.0146)	(0.0173)
Audit_Comm	-0.00765	-0.00991	0.00275	0.0477***	0.00756	-0.0315*
	(0.00997)	(0.00944)	(0.0136)	(0.0103)	(0.0138)	(0.0167)
Leverage	-0.0657**	-0.0484**	-0.0839*	-0.00137	-0.0490*	-0.0623
	(0.0256)	(0.0235)	(0.0459)	(0.0258)	(0.0271)	(0.0440)
Mtb	-2.29e-05***	-1.24e-05	-3.31e-05**	1.71e-06	-3.78e-06	-1.81e-05
	(6.69e-06)	(8.24e-06)	(1.61e-05)	(7.74e-06)	(9.39e-06)	(1.13e-05)
Size	0.00187	-0.00483**	-0.00424	0.0127***	0.0194***	0.0111***
	(0.00246)	(0.00216)	(0.00440)	(0.00321)	(0.00344)	(0.00382)
ROA	-0.00168***		-0.00159**	-0.00600***	-0.00459***	0.00137
	(0.000397)		(0.000686)	(0.000839)	(0.000569)	(0.000967)
ModifiedJones				0.00388	-0.0330	-0.126**
				(0.0459)	(0.0421)	(0.0521)
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Constant	0.193***	0.182***	0.307***	0.0242	-0.0337	-0.299***
	(0.0261)	(0.0261)	(0.0405)	(0.0356)	(0.0431)	(0.0504)
Observations	1,635	1,635	1,293	1,635	1,291	1,291
R-squared	0.107	0.088	0.091	0.257	0.094	0.116

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

5.4 Additional robustness tests

It should also be mentioned that in line with Al-haddad and Whittington (2019) we are testing to use an aggregated proxy for real earnings management which combines the three real earnings management proxies into one proxy. However, since the results did not improve, the regressions are not presented in this study.

Adams and Ferreira (2009) describe that a gender quota as in Norway, might have led to both increased board size and increased independence, since firms which for instance did not have any women on their board before the quota, were obliged to appoint women board members. Hence, in line with Adams and Ferreira (2009), we control if board size and independent board members are driving results for the percentage of women on the board and independent women board members. Therefore, we run our regressions both with and without Total_Board and Ind_per, to see how it affects our result. In the untabulated regressions we can deduce that the results remain basically the same in both cases. Thus, no important differences exist and neither board size nor independence could be argued to drive the percentage of women on the board, in the Norwegian or the Swedish samples.

Due to the issue of collecting information about the dependent/independent board members in the Norwegian sample, we made an additional test to increase the robustness of our result and analyse if the result changes. In the additional test, we turned all (386) observations, where all board members were regarded as dependent, into independent board members. However, the variables of interest are still insignificant in all models, thus no important change of the result was possible to observe.

6. Conclusion, limitations and suggestions for Future Research

6.1 Conclusion

Norway implemented a 40 percentage gender quota on their boards in 2008, and recommendations are put forward in the EU to reach the same levels in 2020. What effect gender-diverse boards, and women on boards as such, has on accruals-based and real earnings management is determined by examining a total number of 2165 observations in Norway and Sweden between the years 2011 and 2018. We further examined what effect particularly independent women board members have on any of the two forms of earnings management.

We found a significant negative relationship between Wom_per and two of our accruals-based earnings management models (ModifiedJones and Kothari) in our Swedish sample. Hence, based on our result from our Swedish sample, a higher proportion of women board members has a decreasing effect on accruals-based earnings management (H1), which is in line with previous research and infers that women are efficient at monitoring and less prone to conduct accruals-based earnings management (Einer et al., 2016; Kyaw et al., 2015; Lakhal et al., 2015). However, no significant relationship was found in the Norwegian sample, hence no conclusion can be drawn. Neither in the interaction test, there was no significant relationship between Norway_WomPer and accruals-based earnings management.

We are neither able to reject nor accept our second hypothesis (H2) based on our results in both countries, hence we cannot say that a higher proportion of women board members has an effect on real earnings management.

Further on, in our Swedish sample, we found significant relationships between IndWom_per and the majority of our earnings management models. The results in all of the accruals-based models, shows that independent women board members have a higher decreasing effect on accruals-based earnings management, than independent men board members. The result for real earnings management is on the other hand ambiguous, since it points towards both directions. Hence, in Sweden, independent women board members have the capacity to reduce accruals-based earnings management to a higher extent than men, and independent women board members also have a higher effect on real earnings management in relation to men (H3).

To conclude, both women board members and independent women board members have an effect on primarily accruals-based earnings management in Sweden, where no gender quota exists, and only weak results are found for real earnings management in Sweden. We are though not able to draw any conclusions for the gender quota pioneer Norway, due to insignificant results. We contribute to the literature of board gender diversity by strengthening prior research of women being able to constrain accruals-based earnings management (Einer et al., 2016; Kyaw et al., 2015; Lakhal et al., 2015). We are also enlightening the effect independent women board members have on earnings management which adds to Benkraiem et al.'s (2017) finding of independent women board members being especially efficient monitors. However, our result also leaves us with questions. Why did not we get any effect of women board members or independent women board members in Norway? Our result might be explained by existing evidence that the gender quota in Norway resulted in younger board members with less experience of top positions (Ahern & Dittmar, 2012). Another explanation of our result might be that if women board members solely are appointed to comply with the quota, they are likely less successful in mitigating earnings management (Debnath et al., 2018). This makes us question if a quota actually is the right way to go in countries with rich informational environment and high gender equality? Based on our result, it could be argued that a recommendation is good enough or even better than an imperative quota, if the goal is to reduce earnings management.

6.2 Limitations

One limitation of our study is that the Norwegian sample is considerably smaller than the Swedish sample. Another limitation is the difficulty of collecting the manual data about board members' dependence/independence in Norway, which we controlled for in our additional robustness tests. Thirdly, as mentioned earlier we are also aware of the issue of reverse causality, which especially is a concern in the Swedish setting, due to the absence of a gender quota. Thus, Swedish women board members might prefer to be board members of firms which conduct less earnings management. Therefore, we are not able to say with certainty that women board members are capable of decreasing earnings management since it also could be the reverse relationship. Even though this is less of a concern in the Norwegian setting, we are unable to draw any conclusions in Norway due to our insignificant results of our variables of interest. We are also aware that for the variable independent women board members (IndWom_per), it exists issues of endogeneity in both settings since the quota does not have an effect on board members' independence. Endogeneity issues are common limitations within accounting and corporate governance research, and our drawn conclusions should therefore be interpreted with this in mind.

6.3 Future Research

In the light of our result one suggestion for future research is to dig deeper into women's effect on earnings management, by except considering their dependence/independence also examining the characteristics of women board members. Who are these women? For instance, do women board members tend to sit in multiple boards and are they usually members of the audit committee? For how many years have they been on the board? What about their previous education and experience? Further on, part of our result is strengthening the evidence of firms conducting some form of real earnings management, however we are not able to draw conclusions about the firms' intention behind the manipulation. Even though real earnings management is a sensitive topic and hard to detect, we find it interesting to use mixed methods in order to increase the chance of getting an understanding of the actual intention behind conducting real earnings management. Through interviewing management and comparing the qualitative and quantitative result towards each other, we hope that one is able to depict the real intention behind.

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