UNIVERSITY OF GOTHENBURG

SCHOOL OF BUSINESS, ECONOMICS AND LAW

Is CFO's equity compensation associated with the degree of accruals-based earnings management?

Authors:

Fredrik Johansson & Sebastian Idehed

Master of Science in Accounting and Financial Management

Abstract: This study investigates the association between CFO's equity compensation and earnings management using absolute discretionary accruals. Collected data is based on European firms that apply IFRS as their main accounting standard between the years of 2009 to 2018, and our final sample consists of 612 firm year observations. The equity compensation is measured using both equity- and options holdings in relation to total compensation of the CFO. Neither our results, or sensitivity analysis, provide any support to our hypothesis that equity compensation is positively associated with the degree of earnings management.

Keywords - *Earnings management, CFO, discretionary accruals, equity compensation*

Supervisor - Savvas Papadopoulos

Graduate School - Master's Degree project

Acknowledgement – We are thankful for the support and guidance by our supervisor Savvas Papadopoulos throughout the entire thesis. We also appreciate all of the helpful comments and insights from our fellow thesis students and seminar leader Mari Paananen.

Table of contents

1. Introduction

A substantial portion of research in the domain of earnings management (EM) focus on chief executive officer's (CEO's) compensation and its connection to financial reporting quality (Cheng & Warfield, 2005; Bergstresser & Philippon, 2006; Almadi & Lazic, 2016). However, more recent studies argue that CEO incentives are less important than those of the chief financial officer's (CFO's) to explain a firm's accruals decision (Jiang, Petroni & Wang, 2010; Chava & Purnanandam, 2010). Considering the shift in focus from CEO to CFO incentives, we aim to examine the association between the equity compensation of CFO's and accruals-based EM.

During the financial crisis of 2007-2009 the issue of executive remuneration came to light and serious concerns were raised. The concerns focused on an ever-increasing executive pay, and how remuneration policies had changed towards a more short-term focus. Hence, the variable pay had an increased relevance in relation to the total compensation of executives (European Commission, 2010). In fact, Hossain & Monroe (2015) finds a positive association between short-term compensation and the absolute value of discretionary accruals for Australian CFOs. This provides an indication that CFOs with short-term compensation are more incentivized to act opportunistically in terms of accruals-based EM.

The issue regarding executive pay stems from what Jensen & Meckling (1976) call the agency problem, which discuss the problem of agency costs that occur when risk preferences and incentives for agents (i.e. managers) are misaligned with the principals' (i.e. shareholders). With the increase of variable pay in the remuneration package of executives, the incentives of these managers can be affected. In fact, earlier studies predating the financial crisis of 2007-2009 confirm that managers rewarded by bonuses in their compensation plans have incentives to select accounting procedures and alter financial reports to maximize their own bonuses (Watts & Zimmerman, 1978; Hagerman & Zmijewski, 1979; Holthausen, 1981). Due to the CFO's role of implementing accounting policies in the firm, and their respective responsibility of accounting quality, they have the possibility to act opportunistically (Mian, 2001; Jiang et al., 2010). Academic research also confirms that the compensation package of CFO's has an effect on EM (Jiang et al., 2010; Hossain & Monroe, 2015). Thus, CFOs are no exception to the theoretical reasoning of the agency theory (Jensen & Meckling, 1976). In fact, Chava & Purnanandam (2010) find a positive relationship between CFO's equity compensation and EM. This behavior could have serious consequences for many different stakeholders, and particularly the shareholders. Ultimately, if the quality of reported earnings is negatively

affected, which fill an important role of transparency and information quality, the usefulness of these reported earnings to forecast future firm performance will drastically be reduced. Since reported earnings provide an overview of how well the company is doing, it is of most importance that the quality of the reported earnings remains high (Dechow, Sloan & Sweeney, 1995; Dechow & Dichev, 2002).

Further, important to consider is that EM can take the form of both accruals-based EM and real EM. Accruals-based EM is a way of changing accounting methods or valuations while real EM is explained as alteration in operations during the fiscal year (Schipper, 1989; Mohanram, 2003; Roychowdhury, 2006). As CFO's have the ultimate responsibility for the quality of financial reporting, and also hold a superior knowledge of accounting and finance, they have both incentives and opportunities in terms of accruals-based EM (Hossain & Monroe, 2015). This is our main reason to solely focus on accruals-based EM, and thus, we hypothesize that the equity compensation of CFOs is positively associated with the degree of accruals-based earnings management.

We base our data on an original sample drawn from firms listed in countries of the European Union that are using IFRS, this yield a sample of 5869 CFO firm year observations between January 2009 to December 2018 gathered from BoardEx. When combined the original dataset with estimated values of discretionary accruals using the Modified Jones model presented by Bergstresser & Philippon (2006), we receive a final regression sample of 612 firm year observations.

Previous studies denote that less research has been conducted with the main focus on the CFO (Baker, Lopez, Reitenga & Ruch, 2018; Geiger & North, 2006; Feng, Ge, Lou & Shevlin, 2011), and this thesis aim to help fill this gap and contribute to the understanding of European CFOs' equity compensation and its potential association with absolute discretionary accruals. However, the results from the Modified Jones model provide no support that CFO's equity compensation is positively associated with the degree of absolute discretionary accruals. Further, any sensitivity analysis using the model by Kothari, Leone & Wasley (2005) or excluding all manufacturing firms yield the same outcome as the Modified Jones model. Thus, our contribution to existing literature is that equity compensation for European CFOs may not be as problematic in terms of accruals-based EM as previously proposed by prior research.

The remainder of the thesis is organized as follows, section 2 includes prior literature and hypothesis development. Section 3 presents research design and sample selection, while section 4 describes our results and discusses additional sensitivity analysis to ensure robustness. Finally, section 5 concludes our thesis with discussion of results, limitations and final suggestions for future research.

2. Previous literature & hypothesis development

Jensen & Meckling (1976) introduced the agency theory which discuss the problem of agency costs when risk preferences and incentives for agents (i.e. managers) are misaligned with principals (i.e. shareholders). The agency theory is often used by authors to explain why managers act in their own best interest, instead of acting in the best interest of the shareholders. Cheng & Warfield (2005) argues that ever since the separation of ownership was demonstrated by Jensen & Meckling in 1976, corporations adapt their business models with various mechanisms, such as equity incentive compensation packages to remedy negative consequences that stems from different incentives between managers and shareholders. Carter, Lynch and Zechman (2009) describe that managers compensation plans tend to include an objective of maximizing the firm value and usually tie the potential compensation to different measures of firm value such as earnings and stock price. In particular, equity compensation has a positive relationship with accounting manipulation, and therefore can incentivize managers to manipulate earnings in order to increase the stock price (Hossain & Monroe, 2015; Jiang et al., 2010). Therefore, it is important to structure the compensation package correctly in order to achieve similar interest between managers, shareholders and other stakeholders. In fact, early studies by Watts & Zimmerman (1978), Hagerman & Zmijewski (1979) and Holthausen (1981) all found evidence that point in the direction that managers rewarded by bonus plans in their compensation do select accounting procedures to maximize their own bonus. This relationship is true when managers have their compensation package strongly connected to the market value of the firm. Hence, the quality of reported earnings can be affected by the incentives that arise from the equity compensation given to managers (Cheng & Warfield, 2005). The large amount of equity compensation has also previously been used as a corporate governance tool, arising from the underlying conflict of interest, and is therefore important in the contracting environment between managers and shareholders (Jensen & Meckling, 1976; Core, Guay & Larcker, 2003). A working compensation structure thus aims to identify the optimal level of equity compensation in a manager's total compensation (Core & Guay 2002).

The issue regarding equity compensation to executives came into light during the aftermath of the financial crisis between 2007 and 2009. The concerns were regarding the increase in executive pay and how remuneration packages had changed towards favoring a more short-term individual focus (European Commission, 2010). Regulators and investors have thus subsequently raised concerns that equity incentives can lead to EM and reduce the informativeness of firms' financial reports (Cheng & Warfield, 2005). The raised concerns stem from the fact that the quality of earnings has an important role in the transparency and

information quality of firms, where accruals is an important aspect when predicting future firm performance (Dechow & Dichev, 2002). Unfortunately, opportunistic behavior can be carried out through EM which Healy & Wahlen (1999, p. 368) define as: *''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 fact, Gao & Shrieves (2002) argue that stock options and bonuses are positively correlated with the intensity of EM. This is further elaborated by Cohen, Dey & Lys (2005) who researched the trend of using stock and option-based compensation as a predictor of opportunistic accounting behavior and found a significant increase in EM between 1997 and 2002. Results by Cheng & Warfield (2005) also indicate that managers with equity incentives are more likely to act opportunistically in order just meet or beat analysts' forecast. The underlying reasoning is that managers with high equity compensation are more prone to sell shares in the future, and therefore more motivated to engage in EM to raise the value of the shares (Bergstresser & Philippon, 2006).

EM can occur in different parts of the external disclosure process due to that it is based on accounting numbers as information. From this, two forms of EM can be identified; *the accruals-based earnings management* and *real earnings management* (Schipper, 1989). Mohanram (2003) argues that most EM is in fact accruals-based, which is denoted as the difference between the firm's earnings and cash flows. Two common examples of accruals-based EM are changes of depreciation method of fixed assets (Zang, 2012) and the delay of asset write-offs (Roychowdhury, 2006). Accruals can also take the form of both discretionary- and non-discretionary accruals, and is a way of changing accounting methods or valuations of already given transactions. Non-discretionary accruals can be exemplified as an increase or decrease of income within a firm, while discretionary accruals include increasing or decreasing estimates of warranty costs, debt reserves and inventory write-downs. Between the two, it is the discretionary accruals that are of most concern since it is solely based on managerial judgement and discretion (Li, McDowell & Moore, 2009). Real EM differs from accruals-based EM and occurs as a conscious choice of manipulating the reported earnings via alterations in characteristics of various real activities, such as ongoing projects, investments and financial decisions (Roychowdhury, 2006).

Since the CEO is head of the company and main responsible for its strategic operations, many previous studies of EM incentives have been conducted with the main focus on CEOs (Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Almadi & Lazic, 2016). However, less research has been conducted with focus on the CFO who is the manager that holds the

ultimate responsibility for the quality of the financial reports (Baker et al., 2018; Geiger & North, 2006; Feng et al., 2011). Considering the CFOs' role in the implementation of accounting policies, and responsibility to provide a fair representation of the firm through the financial statements, they have the possibility to act opportunistically in terms of accruals-based EM (Mian, 2001; Jiang et al., 2010). Hossain & Monroe (2015) also argues for numerous other important CFO responsibilities, which includes disclosure responsibilities, corporate capital structure, financing decisions and risk management. Therefore, CFOs tend to have more expertise in both finance and accounting compared to CEOs and other superior executives, a precondition that could create an information asymmetry between the CEO and the CFO. The information asymmetry may provide additional opportunities for CFOs to implement accounting strategies and exercise accruals-based EM in an attempt to maximize their own wealth, without being detected by other executives (Hossain & Monroe, 2015).

The structure of CFO remuneration packages itself can have an effect on the incentives towards engaging in EM. Previous studies have calculated a ratio between equity compensation and total compensation in order to capture the potential effect on EM (see Bergstresser & Philippon, 2006; Jiang et al., 2010). In fact, Jiang et al. (2010) and Chava & Purnanandam (2010) find that the degree of discretionary accruals has a stronger relationship with CFOs' equity compensation than CEOs'. Based on this, we disregard any real EM that might occur within the firm and limit our thesis to look at accruals-based EM. Chava & Purnanandam (2010) further describe that CFOs financial policy decisions are affected by their personal equity holdings in their respective firm. Their finding suggests a positive association between CFOs' equity compensation and EM. Thus, we hypothesize the following:

H1: The equity compensation of CFOs is positively associated with the degree of earnings management using absolute discretionary accruals.

3. Research Design

Dechow et al. (1995) argues that the starting point for any model used within EM is the measurement of total accruals. The models used within the field of EM aims to identify and separate total accruals into discretionary and non-discretionary accruals. As previously stated, the discretionary accruals are more problematic than the non-discretionary accruals. Thus, we focus on the discretionary accruals and follow those of Dechow et al. (1995), Bergstresser & Philippon (2006) and Kothari et al. (2005) to calculate total accruals as:

$$(1)\ TA_{i,t} = (\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - Dep_{i,t})/A_{i,t-1}$$

Explanation for Eq. (1) is as follows: *i* stands for the individual firm in time *t* for all variables (excluding $A_{i,t-1}$ which denotes the lagged size of assets of firm *i* at period *t-1)*. $TA_{i,t}$ stands for total accruals; $\Delta CA_{i,t}$ represents the change in current assets; $\Delta CL_{i,t}$ is the change in current liabilities; $\Delta Cash_{i,t}$ is the change in cash holdings; $\Delta STD_{i,t}$ is the change in long-term debt in current liabilities; and $Dep_{i,t}$ is the depreciation and amortization. The use of total accruals is argued by Bergstresser & Philippon (2006) to be the primary use of uncovering EM since accruals-based EM involves the shift of earnings between period *t* and *t-1*.

Due to limitations in the original Jones-model by Jones (1991), where total accruals orthogonalize revenues that causes EM to be biased towards zero, a Modified Jones model was introduced by Dechow et al. (1995). The modification is set to measure the discretionary accruals with an error term when discretion is applied over revenues, as it relaxes the original assumption that non-discretionary accruals are constant. A number of authors argue that the Modified Jones model is more powerful than the Original Jones model when testing for EM (Dechow et al., 1995; Chen, 2010). In similarity to Bergstresser and Philippon (2006) we construct Eq. (2) in which the fitted values of the independent variables capture the nondiscretionary accruals. These estimates are then used as the dependent variable in the regression using Eq. (3), where $\Delta REC_{i,t}$ is the change in account receivables, $\Delta REV_{i,t}$ equals the change in sales, and $PPE_{i,t}$ stands for gross property plant and equipment. The level of nondiscretionary accruals estimated through Eq. (3) is then used to compute the level of discretionary accruals following Eq. (4). We estimate by year and adjust for potential industry effect by grouping our sample using the two-digit Standard Industry Classification Code (SIC).

$$(2)\ TA_{i,t} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\Delta REV_{i,t} - \Delta REC_{i,t}\right) + \alpha_3 PPE_{i,t} + \varepsilon_{i,t}$$

$$(3)\ NDA_{i,t} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\Delta REV_{i,t} - \Delta REC_{i,t}\right) + \alpha_3 PPE_{i,t}$$

$$(4)\ DA_{i,t} = TA_{i,t} - NDA_{i,t}$$

The adjustments made to the Modified Jones model is the change in revenues and is adjusted for any difference in receivables during the event period. The Modified Jones model essentially assumes all changes in credit sales during our event period is assumed to be a result from EM. This stems from the rationale that it is easier to both manage and exercise discretion on recognizing revenue on credit sales rather than revenue on cash sales. Ultimately, this should eliminate the zero biased EM that were a major limitation in the 1991 Jones-model (Dechow et al., 1995).

Table 1 Summary of variables

Variables	Database	Definitions
$TA_{i,t}$	Datastream	Total Accruals $[(\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - Dep_{i,t})/A_{i,t-1}]$
$\Delta CA_{i,t}$	Datastream	Current assets in year$_t$ less current assets at year$_{t-1}$
$\Delta CL_{i,t}$	Datastream	Current liabilities in year$_t$ less current liabilities at year$_{t-1}$
$\Delta CASH_{i,t}$	Datastream	Cash in year$_t$ less cash at year$_{t-1}$
$\Delta STD_{i,t}$	Datastream	Short term debt in year t less short-term debt at year$_{t-1}$
$Dep_{i,t}$	Datastream	Depreciation and amortization at year$_t$
$\Delta REV_{i,t}$	Datastream	Change in revenues from year$_{t-1}$ to year$_t$
$\Delta REC_{i,t}$	Datastream	Change in accounts receivables from year$_{t-1}$to year$_t$
$PPE_{i,t}$	Datastream	Gross property plant and equipment
$ROA_{i,t}$	Datastream	Return on assets (Net income/total assets)
$Total\_compensation_{i,t}$	BoardEx	Salary plus bonus at year$_t$
$ONE\%_{i,t}$	BoardEx	Change in total equity linked wealth for each 1% change in stock price at the annual report date for the individual CFO at yeart
$\lvert DAMJ\rvert_{i,t}$	Datastream	Absolute discretionary accruals using Modified Jones model at year$_t$
$Incentive\_Ratio_{i,t-1}$	BoardEx	Incentive ratio at year$_{t-1}$ (ONE%$_{t-1}$/(ONE%$_{t-1}$+Total Compensation$_{t-1}$)
$LN\_Total\_Assets_{i,t}$	Datastream	Natural logarithmic value of total Assets at year$_t$
$MtB_{i,t}$	Datastream	Market to book ratio at year$_t$
$Leverage_{i,t}$	Datastream	Leverage calculated as total liabilities divided by total shareholders' equity at year$_t$
$Std\_Net\_Cash\_Flow_{i,t}$	Datastream	Standard deviation of net cash flow at year$_t$ divided by total assets
$Std\_Sales_{i,t}$	Datastream	Standard deviation of sales at year$_t$ divided by total assets
$Std\_Sales\_Growth_{i,t}$	Datastream	Standard deviation of sales growth at year$_t$
$Gender_{i,t}$	Datastream	1 if the CFO is male, and 0 if female at year$_t$
$OPLOSS_{i,t}$	Datastream	1 if the firm has a negative operating income at year$_t$ and 0 if otherwise.
$INSTOWN_{i,t}$	Datastream	Institutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at year$_t$

This table presents a summary and corresponding definitions of the variables used in our regression model.

3.1 Executive equity incentive measure

We follow the method used by Bergstresser & Philippon (2006) to create a measure for equity compensation and denote the variable as *Incentive_Ratio*$_{i,t}$. We construct the measure *ONE%*$_{i,t}$ using BoardEx data on CFO stock and option holdings:

$$(5)\ \ ONE\%_{i,t} = 0.01 \times Price_{i,t} \times (Shares_{i,t} + Options_{i,t})$$

Price$_{i,t}$ is the firm share price, *Shares*$_{i,t}$ is the number of shares held by the CFO, and *Options*$_{i,t}$ is the number of options held by the CFO. This provide a measurement for the change in total equity linked wealth for each 1% change in stock price at the annual report date for the individual CFO. The measure is used to estimate *Incentive_Ratio*$_{i,t}$:

$$(6)\ \ Incentive\_ratio_{i,t} = \ ONE\%_{i,t}/(ONE\%_{i,t} + Salary_{i,t} + Bonus_{i,t})$$

This measure relies on the same assumption that Bergstresser & Philippon (2006) use, that the *delta* of the options in the CFO's portfolio is one, meaning that one dollar increase in the share price of a firm will correspond to a one-for-one change in the value of the option. *Salary*$_{i,t}$ and *Bonus*$_{i,t}$ is the annual salary and bonus given to a CFO in the respective year (denoted as *Total_compensation* ahead). In similarity to Bergstresser & Philippon (2006) we use the lagged value of *Incentive_Ratio* in our regressions.

3.2 Regression model and control variables

To test our hypothesis, we utilize the following regression model with the measures of absolute discretionary accruals together with test variables, and further control variables:

$$\begin{aligned}(7)\ |DAMJ|_{i,t} = {} & \beta_1 Incentive\_Ratio_{i,t-1} + \beta_2 LN\_Total\_Assets_{i,t} + \beta_3 MtB_{i,t} \\ & + \beta_4 Std\_Net\_Cash\_Flow_{i,t} + \beta_5 Std\_Sales_{i,t} + \beta_6 Std\_Sales\_Growth_{i,t} \\ & + \beta_7 Gender_{i,t} + \beta_8 OPLOSS_{i,t} + \beta_9 INSTOWN_{i,t} + \ \varepsilon\end{aligned}$$

We select our control variables based on previous studies and following Dechow & Dichev (2002) we expect larger firms to have less EM and control for firm size using natural logarithmic value of total assets (*LN_Total_Assets*). Similar to Bergstresser & Philippon (2006) and Jiang et al. (2010), we control for the capital structure of the firm using debt level (*Leverage*) in order to capture potential risk of bankruptcy since it may affect incentives to engage in EM. Including market-to-book ratio (*MtB*) is done to capture future growth opportunities, also in similarity Bergstresser & Philippon (2006). We include volatility of net cash flow (*Std_Net_Cash_Flow*) to account for firm-specific volatility (Hribar & Nichols, 2007). We also control for the volatility of sales growth (*Std_Sales_Growth*) and volatility of sales (*Std_Sales*) since we expect EM to increase with the volatility (Dechow & Dichev, 2002; Jiang et al., 2010). Moreover, Doung & Evans (2016) identify that female CFOs have a considerably lower risk of exercising EM compared to male CFOs with the underlying difference deriving from personal risk, since women are considered to be more conservative. This is reflected in the improved quality of the financial reporting with a female as CFO, therefore we include a dummy variable for CFOs' gender (*Gender*). We also add operating loss (*OPLOSS*) as a dummy variable that takes 1 if the firm has a negative operating income and 0 if otherwise. Since firms with an operating loss naturally have lower accruals, even without any influence by CFOs' accounting choices (DeAngelo, DeAngelo & Skinner, 1994). Finally, we add institutional ownership (*INSTOWN)* as a corporate governance control variable. Institutional ownership both reduce discretionary accruals, and enhance earnings quality for firms, as managers recognize that institutional owners have a better understanding than individual investors (Rajgopal, Venkatachalam & Jiambalvo, 1999; Velury & Jenkins, 2006).

We continue to include year fixed effects to control for factors that are unobservable, such as different macroeconomic events and conditions that are specific for a certain year. We also use industry and country fixed effects to capture systematic differences in the financial environment across countries and industries. In similarity to Chava & Purnanandam (2010) and Jiang et al. (2010) we cluster the standard errors at firm level to address the issue of possible correlation across observations of the same firm in different years and potential heteroscedasticity. In accordance with Stubben (2010) we also winsorize all the variables used in our estimation of the discretionary accruals at the 1st and 99th percentiles before estimating the models. This approach is used to reduce the influence of outliers in our observations. All the control and test variables except *Std_Sales_Growth*, *Gender*, *OPLOSS* and *INSTOWN* are also winsorized this way. We also test our independent variables for multicollinearity using a VIF-test, and untabulated results show no signs of multicollinearity. In similarity to Dechow & Dichev (2002), Hossain & Monroe (2015) and Jiang et al. (2010) our results are based on

regressions using the absolute value of discretionary accruals, since earnings manipulation involves both positive and negative values of discretionary accruals. We choose this since we are only interested in the effect of CFOs' equity compensation on the discretionary accruals, no matter the direction of the discretionary accruals. E.g. one observation of discretionary accruals may equal -1, while the other observation equal 1, without using absolute values the mean of these two observations will be 0. However, by applying absolute values to the observations the mean will instead take the value of 1.

3.3 Sample and data collection

We start by collecting data on CFOs annual salary, bonus and *ONE%*[1] from BoardEx Database between January 2009 to December 2018 for firms listed on markets in the European Union and that are using IFRS as their main accounting standard. Our original data include a sample of 5869 firm year observations for individuals with CFO in their title. We then remove observations that miss data to compute *Incentive_Ratio* and receive a sample of 1697 firm year observations with 287 unique individuals in the dataset. From this sample we use the ISIN-codes to collect the data we need to compute the discretionary accruals using the Modified Jones model from Datastream. Collectively, this yield a sample of 1512 firm year observations for each model. We then include all our test and control variables and receive a final sample of 612 firm year observations (see table 2) and 97 unique firms. Table 3 provides the industry representation, and as observed manufacturing firms represents a large portion of our sample. Table 4 present the country representation, where Germany, Republic of Ireland and United Kingdom – England represents the majority of our sample. Further, Kothari et al. (2005) also eliminate observations that have fewer than ten observations in any two-digit industry code for a given year when estimating the discretionary accruals. Considering our restriction of a rather small final sample we include all companies in our estimation of the discretionary accruals, and hence do not exclude any observations that have less than ten observations in any industry at a specific year. Finally, in similarity to Hossain & Monroe (2015), all financial firms are excluded from the dataset.

[1] *ONE%* is the effect on total equity and option holdings by 1% change in stock price for the individual CFO on the annual report date.

Table 2 Sample Selection (Year 2009–2018)

Sample	Firm year observations
Total number of CFO observations available in BoardEx	5869
CFO Incentive Ratio	1697
The Modified Jones Model	1512
The Kothari Model	1512
Test and control variables	615
Final Sample	**612**

This table presents the number of observations in different steps of the sample selection.

Table 3 Industry Representation

2-digit SIC (Standard industry classification) codes	Sample	Percent %
Mining (10-14)	93	15,20%
Manufacturing (20-39)	288	47,06%
Transportation & Public Utilities (40-49)	87	14,22%
Wholesale Trade (50-51)	26	4,25%
Retail Trade (52-59)	20	3,27%
Services (70-89)	98	16,01%
Total	**612**	**100,00%**

This table presents the industry representation in our final sample.

Table 4 Country Representation

Countries	Sample	Percent %
Denmark	22	3,59%
Finland	15	2,45%
France	34	5,56%
Germany	131	21,41%
Spain	17	2,78%
Netherlands	70	11,44%
Norway	13	2,12%
Republic of Ireland	166	27,12%
United Kingdom - England	144	23,53%
Total	**612**	**100,00%**

This table presents the country representation in our final sample.

4. Results

4.1 Descriptive statistics

Table 5 provide descriptive statistics for our final sample of 612 observations, including our dependent, independent and control variables. The absolute discretionary accruals by the Modified Jones model |*DAMJ*| has a mean of 0.085, and a median of 0.028. The mean of *Incentive_Ratio*$_{t-1}$[2] is presented in the lower range of the sample with a value of 0.081 and a median of 0.036. Notably, our mean is considerably lower than CEOs when comparing to Bergstresser & Philippon (2006) and Jiang et al. (2010) which have 0.263 and 0.236 respectively. However, our *Incentive_Ratio*$_{t-1}$ is closer to Jiang et al. (2010) of 0.105 when they observe their incentive ratio for CFOs. Also, notably when comparing to Jiang et al. (2010) is that the median of the incentive ratio for both CEO's and CFO's are lower than their mean, as is ours. Moreover, *Gender* has a mean of 0.714, meaning that 71.4% of all CFOs in our sample are of male gender, and 28.6% are female. *INSTOWN* receive a mean of 0.19, and a median of 0.12. The mean for *INSTOWN* show that the institutional ownership is on average just below 20%.

Table 5 Descriptive statistics (n = 612)

Variable	Obs	Mean	Median	Std.Dev.	Min	Max
$\|DAMJ\|_{i,t}$	612	.085	.028	.31	0	4.793
$Incentive\_Ratio_{i,t-1}$	612	.081	.036	.155	0	1
$LN\_Total\_Assets_{i,t}$	612	16.097	16.42	2.21	9.992	19.746
$MtB_{i,t}$	612	3.337	2.32	3.234	-7.25	18.78
$Leverage_{i,t}$	612	2.662	1.489	4.626	-7.004	36.113
$Std\_Net\_Cash\_Flow_{i,t}$	612	.052	.033	.054	.003	.345
$Std\_Sales_{i,t}$	612	.222	.148	.226	.002	1.245
$Std\_Sales\_Growth_{i,t}$	612	.083	.047	.414	-.639	4.912
$Gender_{i,t}$	612	.714	1	.452	0	1
$OPLOSS_{i,t}$	612	.083	0	.277	0	1
$INSTOWN_{i,t}$	612	.19	0.12	.204	0	.99

This table presents descriptive statistics of the following variables: $|DAMJ|_{i,t}$ = absolute discretionary accruals using Modified Jones model at year$_t$; $LN\_Total\_Assets_{i,t}$ = natural logarithmic value of total assets at year$_t$; $MtB_{i,t}$ = market to book ratio in year$_t$; $Leverage_{i,t}$ = leverage calculated as total liabilities divided by total shareholders' equity at year$_t$; $Std\_Net\_Cash\_Flow_{i,t}$ = Standard deviation of net cash flow at year$_t$ divided by total assets; $Std\_Sales_{i,t}$ = standard deviation of sales at year$_t$ divided by total assets; $Std\_Sales\_Growth_{i,t}$ = standard deviation of sales growth at year$_t$; $Gender_{i,t}$ = 1 if the CFO is male, and 0 if female at year$_t$; $OPLOSS_{i,t}$ = 1 if the firm has a negative operating income at year$_t$ and 0 if otherwise; $INSTOWN_{i,t}$ = institutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at year$_t$.

[2] The average Total_Compensation, which include the yearly salary and bonus for the CFOs, is $1303.5 thousands. ONE% shows that for a 1% change in stock price at the annual report date the change in total equity linked wealth and average at $82.377 thousands. By observing the median of 41.5 in the ONE%, we can denote that the variable is skewed to the left as it is considerably lower than its mean value.

4.2 Correlation

Table 6 presents the Pearson correlation coefficients between our dependent and independent variables. The results show that *Incentive_Ratio$_{t-1}$* is negatively and nonsignificant correlated with our main model |*DAMJ*|. In addition, the control variable *LN_Total_Assets* is negatively and significantly correlated with |*DAMJ*|, while control variables *Std_Sales_Growth* and *INSTOWN* are positively and significantly correlated with |*DAMJ*|. Further, *Leverage, Std_Net_Cash_Flow, Std_Sales, OPLOSS* and *INSTOWN* are all positively and nonsignificant correlated with |*DAMJ*|, while *MtB* and *Gender* are both negatively and nonsignificant correlated.

Table 6 Pearson Correlation coefficients (n = 612)

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
(1) $\|DAMJ\|_{i,t}$	1.000										
(2) $Incentive\_Ratio_{i,t-1}$	-0.018	1.000									
(3) $LN\_Total\_Assets_{i,t}$	-0.120***	0.022	1.000								
(4) $MtB_{i,t}$	-0.016	0.039	-0.036	1.000							
(5) $Leverage_{i,t}$	0.064	-0.018	0.189***	0.121***	1.000						
(6) $Std\_Net\_Cash\_Flow_{i,t}$	0.010	-0.021	-0.392***	0.258***	-0.187***	1.000					
(7) $Std\_Sales_{i,t}$	0.028	-0.022	-0.353***	0.057	-0.168***	0.593***	1.000				
(8) $Std\_Sales\_Growth_{i,t}$	0.115***	0.023	-0.125***	-0.014	-0.054	0.003	-0.025	1.000			
(9) $Gender_{i,t}$	-0.027	-0.054	-0.012	0.045	0.112***	-0.129***	-0.167***	-0.038	1.000		
(10) $OPLOSS_{i,t}$	0.029	-0.098**	-0.301***	-0.152***	0.019	0.293***	0.048	-0.036	0.021	1.000	
(11) $INSTOWN_{i,t}$	0.116***	-0.054	-0.420***	-0.212***	-0.036	0.088**	0.050	0.045	0.062	0.165***	1.000

This table presents Pearson Correlation coefficients for the following variables: $|DAMJ|_{i,t}$ = absolute discretionary accruals using Modified Jones model; $Incentive\_Ratio_{t-1}$ = incentive ratio at $year_{t-1}$ ($ONE\%_{t-1}$/($ONE\%_{t-1}$+Total $Compensation_{t-1}$); $LN\_Total\_Assets_{i,t}$ = natural logarithmic value of total assets at $year_t$; $MtB_{i,t}$ = market to book ratio in $year_t$; $Leverage_{i,t}$ = leverage calculated as total liabilities divided by total shareholders' equity at $year_t$; $Std\_Net\_Cash\_Flow_{i,t}$ = standard deviation of net cash flow at $year_t$ divided by total assets; $Std\_Sales_{i,t}$ = standard deviation of sales at $year_t$ divided by total assets; $Std\_Sales\_Growth_{i,t}$ = standard deviation of sales growth at $year_t$; $Gender_{i,t}$ = 1 if the CFO is male, and 0 if female at $year_t$; $OPLOSS_{i,t}$ = 1 if the firm has a negative operating income at $year_t$ and 0 if otherwise; $INSTOWN_{i,t}$ = institutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at $year_t$. *** $p<0.01$ ** $p<0.05$ * $p<0.1$

4.3 Regressions

Table 7 provide the results of our regression using the Modified Jones model. As seen in regression (1) in the table below, *Incentive_Ratio*$_{t-1}$ is nonsignificant and thus we find no support for our hypothesis that CFOs' equity compensation is positively associated with the absolute value of discretionary accruals. *MtB* is significant at the 10% level, showing a weak positive association with absolute discretionary accruals. *Leverage* is significant at the 5% level and negatively associated with the degree of absolute discretionary accruals, which is consistent with Hossain & Monroe (2015) but inconsistent with Jiang et al. (2010) who have a significant but positive relationship with discretionary accruals. *LN_Total_Assets, Std_Net_Cash_Flow, Std_Sales, Std_Sales_Growth* and *Gender* are all nonsignificant, thus not associated with the degree of absolute discretionary accruals. Further, we test whether *Incentive_Ratio*$_{t-1}$ becomes significant by only including observations above the 50th, 75th, 80th and 90th percentile. This is done to examine the CFOs that are heavily incentivized by equity compensation. However, untabulated results show no positive association between CFOs' equity compensation and absolute discretionary accruals for any observations above the 50th, 75th, 80th or 90th percentile of *Incentive_Ratio*$_{t-1}$.

Table 7 Regression results – Modified Jones model

	(1)
Variables	$\|DAMJ\|_{i,t}$
Intercept	0.120
	(0.99)
$Incentive\_Ratio_{i,t-1}$	0.038
	(0.88)
$LN\_Total\_Assets_{i,t}$	-0.011
	(-1.42)
$MtB_{i,t}$	0.009
	(1.69)*
$Leverage_{i,t}$	-0.013
	(-2.22)**
$Std\_Net\_Cash\_Flow_{i,t}$	-0.367
	(-1.55)
$Std\_Sales_{i,t}$	0.590
	(1.22)
$Std\_Sales\_Growth_{i,t}$	0.068
	(0.99
$Gender_{i,t}$	0.045
	(1.06)
$OPLOSS_{i,t}$	0.005
	(0.16)
$INSTOWN_{i,t}$	0.030
	(0.76)
Year-fixed effects	Yes
Industry-fixed effects	Yes
Country-fixed effects	Yes
Standard errors clustered at firm level	Yes
Observations	612
R-squared	0.3148

This table presents the regression estimated with the following variables and corresponding definitions; $|DAMJ|_{i,t}$ = absolute discretionary accruals using Modified Jones model at year$_t$; $Incentive\_Ratio_{t-1}$ = incentive ratio at year$_{t-1}$ (ONE%$_{t-1}$/(ONE%$_{t-1}$+Total Compensation$_{t-1}$); $LN\_Total\_Assets_{t-1}$ = total assets at year$_{t-1}$; $MtB_{i,t}$ = market to book ratio in year$_t$; $Leverage_{i,t}$ = leverage calculated as total liabilities divided by total shareholders' equity at year$_t$; $Std\_Net\_Cash\_Flow_{i,t}$ = standard deviation of net cash flow at year$_t$ divided by total assets at year$_t$; $Std\_Sales_{i,t}$ = standard deviation of sales at year$_t$ divided by total assets at year$_t$; $Std\_Sales\_Growth_{i,t}$ = standard deviation of sales in year$_t$ divided by sales at year$_{t-1}$; $Gender_{i,t}$ = 1 if the CFO is male, and 0 if female at year; $OPLOSS_{i,t}$ = 1 if the firm has a negative operating income at year$_t$ and 0 if otherwise; $INSTOWN_{i,t}$ = Insitutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at year$_t$. All variables are winsorized at the 1st and 99th percentiles. Robust t-statistics (in parentheses) are based on standard errors adjusted for clustering at firm-level. *** p<0.01, ** p<0.05, * p<0.1

4.4 Sensitivity analysis

4.4.1 Robustness check

As Kothari et al. (2005) argue, no model used to proxy EM is free from the model misspecification problem. To provide further robustness to our results we use the model presented by Kothari et al. (2005), who argue that the parameter $\left(\Delta REV_{i,t} - \Delta REC_{i,t}\right)$ in the Modified Jones model is expected to generate a large estimated value of discretionary accruals whenever a firm has experienced intense growth in the test period compared to the estimated period. To cope with the issue of abnormal firm operating performance with its potential effect on discretionary accruals, we estimate Eq. (8). This equation strictly follows Kothari et al. (2005) model where $ROA_{i,t}$ or $ROA_{i,t-1}$is added as a variable and is estimated using net income divided by total assets. The fitted value of independent variables in the model capture the non-discretionary accruals and the residuals will provide us the estimate for discretionary accruals. The estimates are by year and adjusted for potential industry effect by grouping the sample using the two-digit Standard Industry Classification Code (SIC). Thus, we receive two different values for the discretionary accruals, *DAKoth1* with $ROA_{i,t}$ and *DAKoth2* with $ROA_{i,t-1}$as the added variable in Eq. (8):

$$(8)\quad TA_{i,t} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_1\Delta REV_{i,t} + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t\,(or\,i,t-1)} + \varepsilon$$

Our results seem to be sensitive to the estimation of discretionary accruals. In fact, we lose significance for *MtB* and *Leverage* using both *DAKoth1* and *DAKoth2* as the absolute discretionary accruals, see regression (2) in table 8. In regression (3) below with *DAKoth2* as the dependent variable, *Std_Sales* is positive and significant at the 10% level which provide a weak indication that the volatility of sales has an effect on the degree of absolute discretionary accruals, and is consistent with results by Jiang et al. (2010). However, $Incentive\_Ratio_{t-1}$ remain nonsignificant and we still lack support for our hypothesis that CFO's equity compensation is positively associated with the degree of absolute discretionary accruals.

Table 8 Robustness check – Kothari model

	(2)	(3)
Variables	$\|DAKoth1\|_{i,t}$	$\|DAKoth2\|_{i,t}$
Intercept	-0.211	-1.221
	(-0.33)	(-0.48)
$Incentive\_Ratio_{i,t-1}$	0.205	0.591
	(1.42)	(1.23)
$LN\_Total\_Assets_{i,t}$	-0.009	0.022
	(-0.42)	(0.25)
$MtB_{i,t}$	0.009	0.007
	(0.64)	(0.19)
$Leverage_{i,t}$	0.02	0.045
	(1.64)	(1.09)
$Std\_Net\_Cash\_Flow_{i,t}$	1.539	-6.37
	(0.79)	(-1.11)
$Std\_Sales_{i,t}$	-0.003	3.502
	(-0.01)	(1.75)*
$Std\_Sales\_Growth_{i,t}$	-0.143	-0.467
	(-1.02)	(-0.87)
$Gender_{i,t}$	-0.273	-0.659
	(-1.31)	(-0.81)
$OPLOSS_{i,t}$	0.035	0.970
	(0.16)	(1.24)
$INSTOWN_{i,t}$	0.521	2.019
	(0.91)	(0.84)
Year-fixed effects	Yes	Yes
Industry-fixed effects	Yes	Yes
Country-fixed effects	Yes	Yes
Standard errors clustered at firm level	Yes	Yes
Observations	612	612
R-squared	0.122	0.143

This table presents the results from our robustness check with the regressions estimated using the following variables and corresponding definitions; $|DAKoth1|_{i,t}$ = absolute discretionary accruals using Kothari model with ROA_t; $|DAKoth2|_{i,t}$ = absolute discretionary accruals using Kothari model with ROA_{t-1}; $Incentive\_Ratio_{t-1}$ = incentive ratio at $year_{t-1}$ ($ONE\%_{t-1}$/($ONE\%_{t-1}$+Total $Compensation_{t-1}$); $LN\_Total\_Assets_{t-1}$ = total assets at $year_{t-1}$; $MtB_{i,t}$ = market to book ratio in $year_t$; $Leverage_{i,t}$ = leverage calculated as total liabilities divided by total shareholders' equity at $year_t$; $Std\_Net\_Cash\_Flow_{i,t}$ = standard deviation of net cash flow at $year_t$ divided by total assets at $year_t$; $Std\_Sales_{i,t}$ = standard deviation of sales at $year_t$ divided by total assets at $year_t$; $Std\_Sales\_Growth_{i,t}$ = standard deviation of sales in $year_t$ divided by sales at $year_{t-1}$; $Gender_{i,t}$ = 1 if the CFO is male, and 0 if female at year; $OPLOSS_{i,t}$= 1 if the firm has a negative operating income at $year_t$ and 0 if otherwise; $INSTOWN_{i,t}$ = Insitutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at $year_t$. All variables are winsorized at the 1st and 99th percentiles. Robust t-statistics (in parentheses) are based on standard errors adjusted for clustering at firm-level. *** p<0.01, ** p<0.05, * p<0.1

4.4.2 Excluding manufacturing firms

Considering that almost half our sample (47.06%) consist of manufacturing firms, it may affect our results. To test this potential effect, we exclude the manufacturing firms and re-run our main regression with the Modified Jones model used to estimate the absolute discretionary accruals. The number of observations drop from 612 to 324 and the number of unique firms drop from previous 97 to 56. When comparing the results between table 7 (Modified Jones model) and table 9 (Modified Jones model when excluding manufacturing firms), we can distinguish a few changes. *MtB* is no longer significant while *Leverage* is now significant at the 1% level instead of previous 5% level, giving further support that *Leverage* in fact is negatively associated with the absolute discretionary accruals. *LN_Total_Assets* is significant at the 5% level, giving support to the fact that when excluding manufacturing firms, the size of the company has a negative association with the degree of absolute discretionary accruals. This corresponds well to the results by Dechow & Dichev (2002), who also argued for that bigger firms have less EM than small firms. *Std_Sales* is also significant at the 5% level, showing a positive association with the absolute discretionary accruals. However, $Incentive\_Ratio_{t-1}$ remains nonsignificant even when excluding all manufacturing firms from our sample, and thus we find no further support to our hypothesis if CFO's equity compensation is associated with the degree of absolute discretionary accruals.

Table 9 Sensitivity results – excluding manufacturing

	(4)
Variables	$\|DAMJ\|_{i,t}$
Intercept	0.545
	(2.12)**
$Incentive\_Ratio_{i,t-1}$	0.102
	(0.96)
$LN\_Total\_Assets_{i,t}$	-0.029
	(-2.30)**
$MtB_{i,t}$	0.024
	(1.33)
$Leverage_{i,t}$	-0.020
	(-2.85)***
$Std\_Net\_Cash\_Flow_{i,t}$	-1.593
	(-1.41)
$Std\_Sales_{i,t}$	0.162
	(2.33)**
$Std\_Sales\_Growth_{i,t}$	0.121
	(1.30)
$Gender_{i,t}$	0.100
	(0.99)
$OPLOSS_{i,t}$	0.099
	(1.27)
$INSTOWN_{i,t}$	-0.003
	(-0.04)
Year-fixed effects	Yes
Industry-fixed effects	Yes
Country-fixed effects	Yes
Standard errors clustered at firm level	Yes
Observations	324
R-squared	0.344

This table presents the results when excluding manufacturing firms from the sample and the regression was estimated with the following variables and corresponding definitions; $|DAMJ|_{i,t}$ = absolute discretionary accruals using Modified Jones model at year$_t$; $Incentive\_Ratio_{t-1}$ = incentive ratio at year$_{t-1}$ (ONE%$_{t-1}$/(ONE%$_{t-1}$+Total Compensation$_{t-1}$); $LN\_Total\_Assets_{t-1}$ = total assets at year$_{t-1}$; $MtB_{i,t}$ = market to book ratio in year$_t$; $Leverage_{i,t}$ = leverage calculated as total liabilities divided by total shareholders' equity at year$_t$; $Std\_Net\_Cash\_Flow_{i,t}$ = standard deviation of net cash flow at year$_t$ divided by total assets at year$_t$; $Std\_Sales_{i,t}$ = standard deviation of sales at year$_t$ divided by total assets at year$_t$; $Std\_Sales\_Growth_{i,t}$ = standard deviation of sales in year$_t$ divided by sales at year$_{t-1}$; $Gender_{i,t}$ = 1 if the CFO is male, and 0 if female at year; $OPLOSS_{i,t}$ = 1 if the firm has a negative operating income at year$_t$ and 0 if otherwise; $INSTOWN_{i,t}$ = Insitutional ownership as the percentage of shares held by investors owning more than 5% of the total outstanding shares at year$_t$. All variables are winsorized at the 1st and 99th percentiles. Robust t-statistics (in parentheses) are based on standard errors adjusted for clustering at firm-level. *** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

The European Commission (2010) raised concerns in the aftermath of the financial crisis between 2007 and 2009, on the increase of executive pay and how remuneration packages had changed towards favoring a short-term individual focus. Concerns were raised regarding the potential effect on the informativeness of firms' financial reports and the corresponding usefulness of them (Cheng & Warfield, 2005; Dechow & Dichev, 2002). More research has previously been conducted with the focus of CEO's pay and remuneration packages, while less research has involved the CFO who holds the ultimate responsibility for the financial reports (Baker et al., 2018; Geiger & North, 2006; Feng et al., 2011). Chava & Purnanandam (2010) continues by describing that CFOs financial policy decisions are affected by their personal equity holdings in their respective firms. Thus, we investigated these raised concerns by examining the association between CFO's equity compensation and the degree of EM by using the absolute value of discretionary accruals.

Our final sample of 612 firm year observations is collected from firms listed on markets in the European Union between 2009-2018 and that are using IFRS as their main accounting standard. The results the Modified Jones model provide no support for our hypothesis that the equity compensation of CFOs is positively associated with the degree of discretionary accruals. The same conclusion holds when we only include observations above the 50th, 75th, 80th, and 90th percentile of $Incentive\_Ratio_{t-1}$. Moreover, the results from our sensitivity analysis with the Kothari model, or by excluding manufacturing firms from our sample, give the same conclusion as our main model. In the end, our results do not confirm previous research by Chava & Purnanandam (2010) and Jiang et al. (2010) that suggest a positive association between CFO's equity compensation and EM. Our results ultimately provide contribution to existing literature, regulators and compensation committees that the equity compensation for European CFOs may not be as problematic in terms of accruals-based EM as previously proposed by prior research.

This study further has a number of limitations. First, as a consequence of excluding observations that lack data of CFOs' equity compensation, and considering both the size of our sample and the rather small number of unique firms in our sample, one may argue that our sample suffer from selection bias. With our smaller sample size, it could be difficult to draw any general conclusions about the population. This is also evident in the fact that we only have 97 unique firms in our sample. Our sample further consists of 47.06 % manufacturing firms, and when excluding manufacturing firms from our sample, only 56 unique firms remain. Further, accruals may be viewed as a noisy proxy for EM as it is not fully based on real numbers

(Kothari et al., 2005). This is especially the case for discretionary accruals, as they are solely based on managerial judgement and discretion (Li et al. 2009). However, our robustness test with a different estimate of discretionary accruals provide the same results, that there is no support for a positive association between CFO's equity compensation and absolute discretionary accruals.

Finding data on both CEO and CFO within the same company has proved to be difficult considering the small number of observations we receive. Baker et al. (2018) denote that there exists an important power relationship between CEOs and CFOs in the US, where accruals-based EM is greater when the CEO is more powerful than the CFO and real-based EM is greater when the CFO is more powerful than the CEO. Therefore, we argue that it exists a future research opportunity to further investigate if this power relationship and EM incentives holds true between European CEOs and CFOs.

According to Zang (2012), managers use real- and accruals-based EM as a trade off influenced by the cost and timings within the firm. The author also states that accruals-based EM is more constrained due to a higher level of scrutiny by auditors, limiting the managers' opportunities of accruals-based EM. This has ultimately shown to have an effect as firms use real-based EM to a greater extent when compared to accruals-based EM. Thus, as this thesis does not provide support for a positive association between European CFOs' equity compensation and absolute discretionary accruals by itself, a future possibility exists to examine the effect of a combined investigation of both real- and accruals-based EM and its potential association with CFO's equity compensation.

6. References

Almadi, M., & Lazic, P. (2016). CEO incentive compensation and earnings management. *Management Decision, 54*(10), 2447-2461.

Baker, T. A., Lopez, T. J., Reitenga, A. L., & Ruch, G. W. (2018). The influence of CEO and CFO power on accruals and real earnings management. *Review of Quantitative Finance and Accounting,* 1-21.

Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics, 80*(3), 511-529.

Carter, M., Lynch, E., & Zechman, L. (2009). Changes in bonus contracts in the post-Sarbanes–Oxley era. *Review of Accounting Studies, 14*(4), 480-506.

Chava, S., & Purnanandam, A. (2010). CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics, 97*(2), 263-278.

Chen, T. (2010). Analysis on accrual-based models in detecting earnings management. *Lingnan Journal of Banking, Finance and Economics, 2*.

Cheng, Q., & Warfield, T. (2005). Equity Incentives and Earnings Management. *The Accounting Review, 80*(2), 441-476.

Cohen, D. A., Dey, A., & Lys, T. Z. (2005). Trends in earnings management and informativeness of earnings announcements in the pre- and post-Sarbanes Oxley periods. Available at SSRN.

Core, J., & Guay, W. (2002). Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. *Journal of Accounting Research*, *40*(3), 613-630.

Core, J., Guay, W., & Larcker, D. (2003). Executive equity compensation and incentives a survey. *Economic Policy Review, 9*(1), 27-50.

DeAngelo, DeAngelo & Skinner. (1994). Accounting choice in troubled companies. *Journal of Accounting and Economics, 17*(1-2), 113–143.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *Accounting Review*, *70*(2), 193-225.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. Accounting Review, 77, 35-59.

Duong, L., & Evans, J. (2016). Gender differences in compensation and earnings management: Evidence from Australian CFOs. *Pacific-Basin Finance Journal, 40*, 17-35.

European Commission (2010). Report on the application by Member States of the EU of the Commission 2009/385/EC Recommendation (2009 Recommendation on directors´ remuneration): COM(2010) 285. *Publications Office of the European Union*

European Commission (2014). Commission Staff Working Document: Impact Assessment, Accompanying the document Proposal for a Directive of the European Parliament and of the Council on amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement and Directive 2013/34/EU as regards certain elements of the corporate governance statement. SWD(2014) 127. *Publications Office of the European Union.*

Feng, M., Ge, W., Luo S., & Shevlin, T. (2011). Why do CFOs become involved in material accounting manipulations? *Journal of Accounting and Economics, 51*(1), 21-36.

Gao, P., & Shrieves, R. E. (2002). Earnings management and executive compensation: a case of overdose of option and underdose of salary? Available at SSRN.

Geiger, M., & North, D. (2006). Does hiring a new CFO change things? An investigation of changes in discretionary accruals. *Accounting Review, 81*(4), 781-809.

Hagerman, R. L., & Zmijewski, M. E. (1979). Some economic determinants of accounting policy choice. *Journal of Accounting and Economics, 1*(2), 141-161.

Healy, P., & Wahlen, J. (1999). A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons, 13*(4), 365-383.

Holthausen, R. (1981). Evidence on the effect of bond covenants and management compensation contracts on the choice of accounting techniques: The case of the depreciation switch-back. *Journal of Accounting and Economics, 3*(1), 73-109.

Hossain, S., & Monroe, G. (2015). Chief Financial Officers' Short- and Long-term Incentive-based Compensation and Earnings Management. *Australian Accounting Review, 25*(3), 279-291.

Hribar, P., & Nichols, C. (2007). The use of unsigned earnings quality measures in tests of earnings management. *Journal of Accounting Research, 45*, 1017-1053.

Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs, and capital structure. *Journal of Financial Economics 3,* 305-360.

Jiang, J., Petroni, K. R., & Yanyan Wang, I. (2010). CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics, 96*(3), 513-526.

Jones, J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research, 29*(2), 193.

Kothari, S. P., Leone, A., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics, 39(1), 163-197.*

Li, S. F., McDowell, E., & Moore, E. A. (2009). Accrual Based Earnings Management, Real Transactions Manipulation and Expectations Management: U.S. and International Evidence. Working paper

Mian, S. (2001). On the choice and replacement of chief financial officers. *Journal of Financial Economics, 60*(1), 143-175.

Mohanram, P. S. (2003). How to manage earnings management? *Accounting World, 13-19.*

Rajgopal, S., Venkatachalam, M., & Jiambalvo, J. J. (1999). Is Institutional Ownership Associated with Earnings Management and the Extent to Which Stock Prices Reflect Future Earnings? Available at SSRN.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*(3), 335-370.

Schipper, K. (1989). Earnings Management. *Accounting Horizons, 3*(4), 91-102.

Stubben, S. R. (2010). Discretionary Revenues as a Measure of Earnings Management. *The Accounting Review, 85*(2), 695– 717.

Velury, U., & Jenkins, D. S. (2006). Institutional ownership and the quality of earnings. *Journal of Business Research, 59*(9), 1043-1051.

Watts, R., & Zimmerman, J. L. (1978). Towards a positive theory of the determination of accounting standards. *The Accounting Review: A Journal of the American Accounting Association, 53*(1), 112-134.

Zang, A. Y. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *Accounting Review, 8*7(2), 675-703.