



**THE INFLUENCE OF THE FINANCIAL CRISIS OF 2008 ON EARNINGS
MANAGEMENT BEHAVIOR**

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Dissertation written under the supervision of Professor Fani Kalogirou

Dissertation submitted in partial fulfillment of the requirements for the MSc. Finance at the
Universidade Católica Portuguesa.

January 2021

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ABSTRACT

This study examines the influence of the Financial Crisis of 2008 on European firms' earnings management behavior. For this purpose, the period from 2005 to 2012 and a sample of 16 different European countries were considered and divided into three periods to examine whether managers manipulated their earnings upwards or downwards through accrual-based or real earnings management. In total, three different models were used for each of the two types of earnings management. The results indicate that European companies engaged in upward accrual-based earnings management before and during the crisis, but after the crisis, their accruals reversed. I find upward behavior in the pre-crisis period for REM. While during the crisis managers used REM for both upward and downward earnings management, in the post-crisis period a downward behavior was found. Furthermore, earnings management drivers and how their influence changed due to the crisis were analyzed. I identify contradicting as well as confirming findings to previous literature. Overall, I find that the crisis has had an impact on the influence of the drivers on earnings management.

A INFLUÊNCIA DA CRISE FINANCEIRA DE 2008 NO COMPORTAMENTO DA GESTÃO DOS GANHOS

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ABSTRATO

Este estudo examina a influência da Crise Financeira de 2008 no comportamento de gestão de lucros das empresas europeias. Para este efeito, foram considerados o período de 2005 a 2012 e uma amostra de 16 países europeus diferentes e divididos em três períodos para examinar se os gestores manipularam os seus ganhos para cima ou para baixo através de uma gestão dos ganhos com base na acumulação ou de ganhos reais. No total, foram utilizados três modelos diferentes para cada um dos dois tipos de ganhos orientadores. Os resultados indicam que as empresas europeias se empenharam numa gestão dos lucros baseada na acumulação para cima antes e durante a crise, mas depois da crise, as suas acumulações inverteram-se. Encontro um comportamento ascendente no período pré-crise para REM. Enquanto durante a crise os gestores utilizaram REM tanto para a gestão dos lucros para cima como para baixo, no período pós-crise foi encontrado um comportamento para baixo. Além disso, foram analisados os factores de gestão dos ganhos e a forma como a sua influência mudou devido à crise. Identifiquei conclusões contraditórias, bem como confirmadas na literatura anterior. Globalmente, constato que a crise teve um impacto sobre a influência dos factores de mudança na gestão dos ganhos.

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1. Introduction

In the last decades, the world has been involved in many different accounting scandals that have damaged the trust of people and especially of creditors and investors. In many of these scandals, the origin was falsified accounting data with many companies hiding high debt to attract investors and look profitable, a behavior also known as "cooking the books". These potentially fraudulent activities of managers, who falsify financial statements in their interest, are often tailored to reveal non-existent earnings and might even be in the interest of other "inside" stakeholders. However, managers are limited in their accounting flexibility. The flexibility heavily depends on the accounting standards set by the government.

Until 2005, each EU member had its own standards, which made it harder for investors and creditors to compare companies in the EU and filter financial advantages and disadvantages. In that year, "IFRS was widely adopted in the EU to facilitate the comparability of financial statements of publicly traded companies across the EU, thus ensuring the development of an integrated capital market that functions effectively, smoothly and efficiently, improving investor protection, enhancing confidence in the financial markets and the free movement of capital in the single market, making financial statements usable for cross-border transactions or for listing on all stock exchanges in the world (IFRS, n.d.). In addition to the points already mentioned about increased comparability, better quality accounting also helps investors to evaluate the performance of companies as well as companies themselves to prepare more accurate budgets and future projections." ("Financial reporting", 2020)

Other drivers contribute to limiting accounting flexibility as well, leading to higher earnings quality and less earnings management. For example, audit quality can have a big impact. Auditors are assumed to be independent and examine the financial reports of a company. In this regard, auditors examine whether the financial reports reflect the financial position of the company at a given point in time and contribute to better earnings quality ("What is an audit", 2020). Leverage can lead to a reduction in manipulation, too. If a company is heavily indebted, its activities are restricted, and firms are obliged to follow the creditors' agreements.

Although accounting flexibility is restricted by high standards and other drivers, managers continue to manipulate earnings. These activities are often based on accounting choices that have a weak or even non-existent effect on cash flow from operations. This way to manipulate earnings through accruals is known as Accrual-based Earnings Management (AEM). Managers can also increase earnings through real activities by reducing or increasing certain costs, an

approach known as Real Earnings Management (REM) activities. Past research has analyzed these activities and gained valuable insights - the two different earnings management practices and past research is analyzed in more detail in the literature review section. However, in the last decade, the financial crisis of 2008 hit the world economy strongly. This led to a sharp economic downturn and thus to financial distress in some economies, leading to a debt crisis in Europe. An economic shock like this disrupts a company's usual operations and their associated accounting choices. As a result, firms are in an uncertain financial position.

My motivation for this research is to analyze earnings management behavior before, during, and after the crisis. I focus on different earnings management drivers and evaluate their impact on earnings management practices during these three different periods. Furthermore, the general shock of the crisis on earnings management is controlled and analyzed. At the same time, the manipulation of earnings is analyzed, and it is seen whether companies adjust them upwards or downwards. I find upward behavior for the pre-crisis period for AEM as well as REM. During the crisis, managers manipulated upwards through AEM, but both behaviors was found for REM. In the post-crisis period, companies tend to manipulate downwards.

The paper is organized as follows, section 2 is the literature review and describes earnings management and its drivers in more detail. Section 3 describes my data and methodology. More specifically, it discusses my models and explains how earnings management is detected. In section 4, the results are presented and interpreted, and previous literature is addressed and compared. The conclusion and limitations of my findings are summarized in section 5.

2. Literature Review

2.1 Earnings Management in general

A central question in accounting research is the extent to which managers adjust reported earnings for the benefit for specific stakeholders. In most cases, earnings management serves the purpose to avoid earnings decreases and losses. As a result, managers trying to achieve certain objectives like profitability or a stable growth rate of earnings per share through reducing or increasing earnings (Burgstahler and Dichev, 1997).

The following definitions are found in past research. "Earnings management is the process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about a desired level of reported earnings. Moreover, it is a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain" (Schipper, 1989, p.92). Another definition by Healy and Wahlen (1999) says, that "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 numbers (p.368).” Both definitions take actions of management within the context of financial reporting into account. Next to that, these definitions allow to draw the purpose of managing earnings as hiding deteriorating performance results in that managers trying to strengthen or weaken the overall financial picture of a company in the interest of a specific stakeholder.

2.2 Motivation of Earnings Management

There are different motives behind the manipulation of earnings. Burgstahler and Dichev (1997) name two different theories that could play a role. On the one hand, they mention the transaction cost theory. This state, that managers avoid reporting earnings decrease and losses to reduce the costs which are imposed in transactions with stakeholders. However, this assumes that stakeholder decisions are depending on heuristic cutoffs at zero changes or levels of earnings. Burgstahler and Dichev (1997) mention two assumption on which the transaction theory relies on: i) Information about earnings affects the terms of transactions between the firm and its stakeholders and, more specifically, terms of transactions are generally more favorable for firms with higher, rather than lower, earnings; (p.122) ii) The costs of storing, retrieving, and processing information are sufficiently high that at least some stakeholders determine the terms of transactions with the firm based on heuristic cutoffs at zero levels or zero changes in earnings (p.122). On the other hand, Burgstahler and Dichev (1997) state the prospect theory as a second reason. The prospect theory is derived from Kahneman and Tversky (1979). The theory suggests that the largest gains in utility, and hence the largest incentives to manage earnings, occur when moving from a relative or absolute loss to a gain.” This model shows how people behave in situations that involve risk and uncertainty. Furthermore, it explains the bias of people’s behavior that they think in terms of expected utility to their last reference point rather than absolute outcomes. Moreover, according to the theory the value function of individuals is concave in gains and convex in losses. To go more in detail, the function is steepest around wealth reference points. As a result, for a given increase in wealth, the corresponding increase in value is greatest when the increase in wealth moves the individual from a loss to a gain relative to a reference point (Kahneman and Tversky, 1979). This leads managers to manipulate earnings to increase the value of stakeholders. It also assumes, that managers especially manipulate earnings when they can move from net loss to a net profit. On the one hand, one can distinguish between opportunistic earnings management

to mislead investors and creditors by publishing manipulated earnings and on the other hand, and according to the Transaction cost theory, in an informative way to portray the true financial picture of firms' performance to stakeholders and hence to avoid costs of transactions.

2.3 Accrual-based Earnings Management

The manipulation of reported accounting information by earnings management can seriously affect the ability of both potential as well as existing creditors and investors to correctly assess future company prospects and the administrative use of committed funds. So, the question arises how managers take actions to change accounting information in their interest. In the earnings management literature, a distinction is made between Real- and Accrual-based Earnings Management. Managers can use either or both to reach the earnings target. Accrual-based Earnings Management (AEM) is manipulating accruals with no direct cash-flow consequences. That, for example, covers under provisioning for bad debt expenses and delaying asset write-offs (Roychowdhury, 2006). To give a more in detail example, companies selling their products on credit, would recognize receivables, a form of accruals. On the one hand and along these lines, the manager can increase or decrease income by accruals. These accruals relate to business activities and they are called non-discretionary accruals. On the other hand, managers can use accruals including an increase or decrease of estimates of bad debt reserves, warranty costs, and inventory write-downs. These accruals are known as discretionary accruals. That are non-obligatory expenses and ergo creating manipulated concerning changes in reported earnings because they are not recognized in cash flow statement and hence have no direct impact on cash flows. That makes them not easy to detect (Peasnell et al., 2005). A common model to analyze AEM is the Jones Model. The model is based on the equation that total accruals equals the difference between net income and cash flows. Thereby, the model takes both non- and discretionary accruals into account. Past research modified the model and took more variables into account (Filip and Raffournier, 2012). The model will be described in detail in the section methodology of the research paper.

2.4 Regulations and reduced flexibility on AEM

AEM is dealing with accounting choices resulting in a weak or not existing effect on cash flow operations. Nevertheless, past research showed that AEM has decreased due to regulations like the Sarbanes Oxley Act, which was the response to the accounting scandals like Enron (Cohen et al., 2007). The Sarbanes Oxley Act is a U.S. federal law that intends to protect investors by making corporate disclosures more reliable and accurate. Also, Europe established several protections like the European Union's Financial Services Action Plan to enhance more reliability and accuracy. Further since 2005, European listed companies are required to prepare

consolidated financial statements based on International Accounting Standards (IAS/IFRS). Zéghal et al. (2011) examined the influence of IFRS on earnings manipulations on French listed companies. They find evidence that the mandatory adoption of IFRS reduced the use of discretionary accruals. Next to that, IFRS adoption has unified the accounting standards to a certain extent in Europe. Due to the fact, that the European countries had their own individual standards, which also reflected the culture of the nation, the question arises if IFRS limited the cultural differences on earnings management across all European countries. This also depends on how managers exercise their discretion or judgement in accordance with the more principle based IFRS. Gray et al. (2015) showed that managerial discretionary accrual choices and the ability of formal institutions (e.g., standards and rules) to restrict earnings discretion vary according to national cultural influences.

In addition to a more regulated market, the auditing quality of the firm plays a role as well. Chi et al. (2010) find evidence that manipulation through accruals is constrained by higher quality auditing. They used as primary proxy auditor industry expertise and presence of Big 4 auditor for audit quality. Furthermore, they examine if audit quality and Big N auditors have a positive relationship. Indeed, they find similar, but weaker results. Moreover, the authors suggesting, that due to constrained accrual earnings management, firms switching to potentially more costly real earnings management. In addition, they investigated that longer audit tenure relates to higher real earnings management.

AEM is further restricted by companies' previous reporting choices. Barton and Simko (2002) have empirical evidence that the level of net assets partly reflects the extent of previous Earnings Management. Due to the articulation between the income statement and the balance sheet ensures that accruals reflected in earnings also reflected in net assets. Therefore, managers ability to optimistically bias earnings decrease with the extent to which net assets are already overstated. According to Barton and Simko (2002), firms with larger levels of net operating assets relative to sales will have reported larger cumulative levels of income-increasing accruals in the past. Moreover, Firms with larger levels of net operating assets (relative to sales) reported larger cumulative levels of abnormal accruals in the previous 20 quarters, consistent with prior income increasing earnings management leading to overstated net assets (Barton and Simko, 2002).

2.5 Real Earnings Management

Chi et al. (2010) have empirical evidence that managers tend to resort to Real Earnings Management (REM), when accounting flexibility is reduced, and firms have strong incentives to manage earnings. Factors like leverage constraints AEM, but have a significantly positive

effect on REM. Furthermore, higher levels of leverage positively and significantly associate with higher levels of upward REM. In contrast to AEM, higher (rather than lower) levels of leverage are not observed with higher signed discretionary accruals consistently and significantly (Anagnostopoulou and Tsekrekos, 2017). However, REM can be hidden in everyday business activities and therefore more difficult to detect and monitor than AEM. As a result, past research has hypothesized that REM can be more harmful than AEM for future firm performance. Chan et al. (2015) investigated whether the decision to engage in AEM or REM is a joint one, with AEM activities depending on levels of unexpected REM incurred during the year, which depends on relative costs and benefits of both practices. Therefore, there is an existence of a complementarity effect between unexpected levels of REM and AEM. Nonetheless, firms tend to increase REM activities. Roychowdhury (2006) finds evidence, that firms tend to boost sales through temporarily price discounts. Another action is to lower cost of goods sold through overproduction and benefiting from economies of scale. Moreover, REM can be achieved through the reduction of discretionary expenditures to improve reported margins. Which leads to a reduce of R&D activities, advertising expenses and selling as well as General and Administrative expenses (SG&A). These reductions increase the performance in the short term, but in the long term it worsens the performance of the company. Other factors that influence REM include industry affiliation as well as product market pricing power, which can limit or enhance real activities manipulation. Datta et al. (2013) find a link between product market pricing power of firms and the degree of earnings management. Furthermore, they also took the competitiveness of the industry into account. They found empirical evidence, that firms with weaker product market pricing power within an industry or firms in competitive industries are prone to greater earnings management than their counterparts, which have a greater pricing power and in a less competitive industry. Also, the anticipated stock of inventories and receivables constrains overproduction or a sales boost. Next to that, incentives to meet zero earnings also limits the ability to manipulate earnings. Less robust evidence for manipulation of real activities was find for meeting annual analyst forecasts (Roychowdhury, 2006).

2.6 Earnings Management in economic distress

After analyzing the motivation, reasons, and behavior of earnings management in normal circumstances, the question arises how companies' earnings management behavior changes during a financial and economic shock like the financial crisis of 2008. Do manager manipulate earnings to stay profitable and like the prospect theory suspects to go from a loss to a win? But especially during crisis firms are heavily constrained and have difficulties to reach a positive

result. Therefore, they could manage the earnings in a way to reduce the loss. As a result, and back to the prospect theory, the reference point shifts to a big loss and they try to shorten the economic damage. There are common reasons, that earnings management should be higher in periods of economic distress. Filip and Raffournier (2012) cite various past research, which also suggest that in such periods firms probably exhibit lower earnings, which should give the manager motivation to manipulate them by income-increasing management and thus compensate for the decrease in operational performance and its associated decline in stock price. Moreover, they also mention debt covenants, which often relate to the earnings and therefore they could manipulate them in order to reduce the probability of violation.

That said, there is evidence that manager tend to manage earnings downward in times of economic distress, too. Regarding the debt covenants, firms could manage earnings downward as well. This would lead to a debt restructuring and the need of concession from lenders like banks. Nonetheless, lenders could refuse it and require liquidation. However, in times of crisis the value of the firm is probably low, which could lead to acceptance of the new conditions. In addition to that, in times of economic distress, firms receiving monetary help from the government. To benefit from this help, past research finds that firms manage their earnings downward. Next to that, in recessions the risk of liquidation is higher, and an increased uncertainty of future outcomes should motivate firms to demand more conservative earnings. In line with the above arguments, past papers find evidence that earnings management has significantly decreased during financial crisis (Filip and Reformer, 2012). Furthermore, De Angelo et al. (1994) investigated the accounting choices of troubled firms, which had at least three annual losses in a six-year period and reduced cash dividends - an increase in dividend cash payments is assumed to signify positive prospects, while a reduction of these payments suggests substandard performance in the future. According to De Angelo et al. (1994) findings, managers of troubled companies manipulate earnings to reflect the financial situation of the firm, rather than to exploit accounting choices to avoid debt covenant violations or to bloat income. Furthermore, the authors show that firms with binding covenants are predicted to have higher accruals than firms without covenants in years before the dividend reduction. This is due to the incentive of the manager to manipulate earnings upward to mitigate covenant violations. During the dividend reduction and the following years, firms tend to manage earnings downward and to have large negative accruals. Moreover, noncash write offs for firms with covenants are sufficiently extensive to eliminate unrestricted retained earnings available for dividend payouts. One could conclude from this, that noncash write offs serve the purpose to present creditors and lenders a credible signal that the company is dealing with the financial

problem. A second reason besides the reflection of the financial situation of the firm for negative accruals is that earnings management is associated with the variety of contractual renegotiations engendered by financial trouble (De Angelo et al., 1994, p.141). These results are consistent with the findings of Charitou et al. (2007). They also investigated troubled firms during distressed periods and take auditing quality as well as change in management into account. They find evidence for earnings-decreasing behavior as well. Their findings suggest that earnings decrease could be due to new managers earnings management choices and that qualified auditing leads to more conservative accounting choices. Thereby, the author defines qualified auditing through big audit companies.

2.7 Hypotheses

To conclude, a lot of research has been conducted to investigate the presence of earnings management. Authors tried to find evidence that earnings management shifted from AEM to REM. However, empirical evidence for the behavior of earnings management in times of crisis is limited. Moreover, drivers of earnings management have not analyzed during the Financial Crisis of 2008. In addition, prior literature heavily focuses on AEM with significantly less work examining REM. Therefore, this paper aims to investigate the behavior of AEM and REM before, during and after the Financial Crisis of 2008. Since past literature assumes that during financial distress companies tend to reduce their earnings, the first hypotheses are as follow:

1. *H1: Manager engage in earnings-decreasing AEM behavior during the recent Financial Crisis.*
2. *H2: Manager engage in earnings-decreasing REM behavior during the recent Financial Crisis.*

Moreover, due to the fact that this paper also investigates the behavior before and after the crisis, I examine these different time spans with the following hypotheses:

3. *H3: Before and after the crisis, manager engaged in earnings-increasing AEM behavior.*
4. *H4: Before and after the crisis, manager engaged in earnings-increasing REM behavior.*

Finally, as mentioned above other factors like auditing or leverage can constrain earnings management. However, an economic downturn disrupts a company's usual operations and that might affect the impact of such factors on managerial behavior. Therefore, my next hypothesis is the following:

5. *H5: Factors constraining earnings management behavior are less effective during the crisis.*

3. Methodology

3.1 Sampling and Data Collection

To compile my sample, only countries that belong to the EU and have reported under mandatory IFRS since fiscal year 2005 were considered. The reason for this is that accounting standards influence earnings and must therefore be reported under the same high standards. Countries such as Luxembourg or Estonia, which have too few company observations were removed from the sample. Although Norway is not a member of the EU, they nevertheless opted for the adoption of IFRS. For this reason, Norway was included in the sample. Even though Switzerland is an important economic partner of the EU and they also adopted IFRS, they were not considered due to currency exchange fluctuations and its associated shock for businesses. In the end, my sample consists of 16 different countries.

The Datastream Global Equity Index specified by Reuters Datastream was used for each country. Each index contains between 50 and 550 different listed companies. This leads to 1948 different companies. Although the financial and insurance industries are also required to report under IFRS, they have other specific regulations. Furthermore, the models used in this paper are designed exclusively for commercial or industrial companies. For these reasons, these two industries have been removed from the sample. After this selection 1180 firms remain. Due to incomplete data or other reasons further 143 companies were removed. The final sample consists of 1037. In Appendix 1, the countries and the number of companies can be found.

As this paper examines the behavior of earnings management before, during and after the 2008 financial crisis, three different time spans were considered. The first begins with the mandatory adoption of IFRS in 2005 and ends at the end of 2007. Although 2007 showed the first major signs of recession, Europe was not yet as affected as the continent was in 2008 and 2009. These two years form the second period, the crisis period. The third and final period runs from 2010 to 2012. The sample is further divided into 9 industries. The different industries are defined by the Industry classification Benchmark ICBIC code. Each numeric variable is indicated in Euro.

3.2 Estimation Models

3.2.1 Accrual-based Earnings Management

To detect manipulations by accruals, three different modification of the Jones Model. (Jones 1991) are considered. The first modified model was created by Dechow et. al (1995). This

model represents the standard deviation of the residuals from the modified Jones Model. The model is structured as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{A_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

The variables are defined as follows:

- $TA_{i,t}$: Total accruals using the cash flow approach defined as the difference between net income of the period and operating cash flow
- $A_{i,t-1}$: Total assets at the beginning of the period. All items in the regression are lagged by one period
- $\Delta REV_{i,t}$: Change in revenues
- $\Delta AR_{i,t}$: Change in accounts receivables
- $PPE_{i,t}$: Absolute value of property, plant and equipment in the current period;
- $\varepsilon_{i,t}$: Error term

The former Jones model assumes that all variances of revenue are non-discretionary. However, managers are able to manipulate earnings through credit sales. Dechow et al. (1995) deducting the variance of receivables in order to mitigate this. Moreover, the Error term will be the proxy of the analysis for accrual-based earnings management.

The second model I use for accrual earnings management was developed by Kothari (2005). He adds ROA as a performance measure. He is doing so, because of the matching principle and the fact that accrual performance is based on the return on assets as well as on the industry. The model is structured as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \beta_3 ROA_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

All variables are the same as before except for the measure ROA - Return on Assets.

The third and last model for detecting accrual manipulations that I use was developed by Rahman and Sharur (2005).

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \beta_3 ROA_{i,t-1} + \beta_4 BM_{i,t} + \varepsilon_{i,t} \quad (3)$$

The variables are as before, only BM - book value of equity divided by market value of firm - is added. All models are run separately for every industry and year.

3.2.2 Real Earnings Management

To capture real earnings manipulations, I use three different models that were developed by Dechow et al. (1998) and by Roychowdhury (2006). As mentioned in the Literature Review section, these models are especially designed to detect manipulations by sales boost, overproduction or managing discretionary costs like R&D, advertising, or SG&A. The first model examines abnormal operating cash flows from operations to find accelerated sales through discounts.

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{REV_{i,t}}{A_{i,t-1}} + \beta_2 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

The specified variables are the same as in the modified Jones Models. The only one that is added is CFO, which stands for cash flow from operating activities. Also, in this case, the error term is of major importance for analyzing real earnings management activities.

The second model examines overproduction so that the company can benefit from economies of scale and thus have lower production costs.

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{REV_{i,t}}{A_{i,t-1}} + \beta_2 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (5)$$

Again, the variables remain unchanged. PROD stands for production and is composed of the addition of change in Inventory and COGS.

The third and last model of REM detects the management of discretionary expenses. Since IFRS came into force, advertising and marketing costs have been documented under SG&A.

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \beta_1 \frac{REV_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (6)$$

The newly added variable DISEXP therefore consists of the sum of R&D and SG&A As has been done with the Accruals models, all models are cross-sectional for each industry and year. As mentioned in the first section of Methodology, my sample was divided into three time periods. For each time-period, each model was applied. So that in the end I have 18 different results from six different models.

3.2.3 Control for Earnings Quality

In order to control for and explain the error terms obtained and the associated manipulations, a further regression was set up.

$$AEM/REM = \alpha_1 + \beta_1 IND + \beta_2 SIZE + \beta_3 BIG4 + \beta_4 LEV + \beta_5 GDP + \beta_6 COUNTRY + \varepsilon_{i,t}^{(7)}$$

The variables are defined as follows:

- IND: Categorical Variable (9 different according to IBCI)
- SIZE: Log of Total Asset
- BIG4: Dummy, 1 if audited by BIG4, 0 if other
- LEV: Leverage, measured by Total Liabilities / Total Equity
- GDP: Change in GDP
- COUNTRY: Categorical Variable. 19 in total, 16 different countries in the sample and in addition three more countries because some companies are listed in other countries. This is due to the fact, that Datastream Global Equity list for the UK include companies from other nations than England.

In addition, three more dummies were added in the regression over the whole time-period (2005-2012). These each represent a time span, before, during and after the Financial Crisis of 2008.

4. Results

4.1 Descriptive Statistics of Variables

Descriptive information regarding the main variables is presented in Table 1.

	Obs.	Mean	Median	Std Dev	Min.	Max.
<i>Cost of Goods sold</i>	9700	0.6616	0.5278	0.6322	-0.1792	10.9229
<i>Market Cap.</i>	9302	0.9842	0.7897	2.0673	0.0048	144.6956
<i>Net Income</i>	9847	0.0467	0.0540	0.0947	-1.6710	1.2068
<i>Operating Cash Flow</i>	9676	0.0863	0.0913	0.0947	-1.4179	1.0577
<i>PPE</i>	9826	0.3163	0.2560	0.2627	0	1
<i>R&D</i>	3775	0.0579	0.0162	0.2034	0	4.6128
<i>Receivables</i>	9836	0.1853	0.2170	0.1340	0	1
<i>Revenue</i>	9847	0.9437	0.7291	0.7291	0	11.5655
<i>SG&A</i>	6816	0.2031	0.1489	0.2112	0	2.2435
<i>Sh. Equity</i>	9847	0.4043	0.3967	0.2791	-1.2120	1.1519
<i>Total Inventory</i>	9709	0.1167	0.0790	0.1366	0	1

Table 1: *Descriptive Statistics of Sample. All variables are scaled by lagged assets.*

If you look at the observations, it is easy to see that companies were not always publishing all data, especially for R&D and SG&A. Which could be due to the industry or the corporate

culture. Therefore, as mentioned before, it makes it difficult to apply model three of REM. As you can see in the table 1, the standard deviations of the sample are very high. This is because the sample consists of nine different industries and 16 different countries from listed companies. Leading to a high difference between Minimum and Maximum. In total the sample consist of 9847 firm year observations. However, this also includes the fiscal year 2004, which was only used to calculate necessary variables like lagged assets for fiscal year 2005 and has otherwise no influence on the analysis.

4.2 Descriptive Statistics of the Error Term

Descriptive information regarding the error terms of the six earnings management models is presented in Table 2.

<i>Variable</i>	Obs.	Mean	Median	Std. Dev.	Min	Max
<i>DECHOW</i>	8206	0.000	0.002	0.049	-0.849	0.997
<i>KOTHARI</i>	8501	0.000	0.002	0.048	-0.769	0.967
<i>RAHMAN</i>	8488	0.000	0.002	0.043	-0.770	0.860
<i>ABN_CFO</i>	8517	0.000	0.001	0.029	-0.726	0.249
<i>ABN_PROD</i>	7263	0.000	0.001	0.042	-0.992	0.797
<i>ABN_DISEXP</i>	791	0.000	0.000	0.002	-0.569	0.019

Table 2: *Descriptive Statistics of Error Terms (2005 – 2012).*

Looking at the descriptive statistics, the mean approaches 0 for all models. The error term in a regression accounts for the variation in the dependent variable that is not explained by the independent variables, hence a mean value close to zero shows that the models are unbiased. Number of observations range between 8517 for ABN_CFO and 791 for ABN_DISEXP. Due to few observations of ABN_DISEXP results of this model should be viewed with caution.

4.3 Descriptive Statistics of Explanatory Variables

The information of the explanatory variables SIZE, LEVERAGE, GDP and BIG4 is presented in Table 3.

	Obs.	Mean	Median	Std. Dev.	Min	Max
<i>SIZE</i>	8586	0.006	0.005	0.023	0.000	1.883
<i>LEVERAGE</i>	8586	0.016	0.003	0.079	0.000	2.874
<i>GDP</i>	8748	0.011	0.016	0.029	-0.093	0.093
	Obs.	YES	NO			
<i>BIG4</i>	8748	0.77	0.23			

Table 3: *Descriptive Statistics of Explanatory Variables. Scaled by lagged Assets.*

As mentioned before, GDP stands for the change in GDP. Moreover, the most firms are audited by BIG4. BIG 4 implies the companies EY, Deloitte, PwC, and KPMG. The description of the categorical variables of country and industry can be found in Appendix 1&2.

4.4 Analysis of the Manipulation Behavior

Due to the fact that earnings management is measured by the error term of the previous mentioned models, the average is close to zero for every year, making studying the difference in the average between periods nonsensical. Hence, in order to get insights about the earnings management behavior before-, during- and after-crisis, I break down my sample into positive and negative manipulations and run the regression for each separately. This way, I can prevent the average from going towards zero and I can find significant results for upward or downward manipulations. To test the manipulations for the three periods, I include three dummies for each time span. The first regression output shows the positive error terms and is followed by the negative earnings management output.

The results of the positive error terms are listed in Table 4.

VARIABLES	(1) DECHO W	(2) KOTHAR I	(3) RAHMAN	(4) ABN_CF O	(5) ABN_PRO D	(6) ABN_DISEX P
SIZE	-0.0005 (0.001)	-0.0005 (0.001)	-0.0004 (0.001)	-0.0012 (0.001)	4.258*** (0.520)	8.430*** (1.901)
BIG4	-0.017*** (0.003)	-0.009*** (0.003)	0.0104*** (0.003)	-0.001 (0.003)	0.0184*** (0.006)	0.0538*** (0.02)
LEV	-0.0003 (0.000)	-0.0002 (0.000)	-0.0003 (0.000)	0.0003 (0.001)	0.0206 (0.019)	-1.943*** (0.615)
GDP	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.0001** (0.000)	-0.000 (0.000)	0.000101 (0.000)
Before	0.0733*** (0.005)	0.0052 (0.004)	0.0622*** (0.005)	0.002 (0.004)	0.133*** (0.013)	-0.0149 (0.014)
During	-0.0089** (0.004)	0.0590*** (0.003)	-0.0037 (0.004)	0.0663*** (0.004)	-0.0259** (0.01)	0.0068 (0.021)
After	-0.016*** (0.003)	-0.012*** (0.003)	-0.015*** (0.003)	-0.0064** (0.003)	-0.0212*** (0.008)	0.0577* (0.033)
Industry fixed effects	NO	NO	NO	NO	NO	NO
Country fixed effects	NO	NO	NO	NO	NO	NO
Obs.	3,631	3,640	3,663	5,334	2,918	394
R-squared	0.22	0.19	0.19	0.06	0.032	0.068

Standard errors in parentheses

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

Table 4: *Regression output of the positive earnings management of the whole time-period.*

Looking at the coefficients of the dummy variable Before, we can find an earnings management upward behavior for all models. This is due to the fact, that sales discount and overproduction

increase will have a negative impact on cash flow of operations, but a reduction of discretionary expenses will have a positive effect on cash flow of operations (Roychowdhury, 2006). Hence a negative coefficient of the sixth model would translate into upward manipulations, while a positive coefficient would translate into downward manipulations. For the AEM models, I find statistical significance for the Dechow as well as the RahmanSharur model at the 1% level. The overproduction model is significant at the 1% level as well. However, for the other two REM models no statistical significance was found. The dummy variable During shows contradicting findings for the AEM models. While the Dechow as well as the RahmanSharur model have a negative coefficient and therefore suggest a downward behavior, the Kothari model has positive coefficient which suggests upward behavior. While model 1 and 2 are meaningful, no statistical significance could be found for model 3. The artificial sales model is significant and has an upward behavior. However, the other two REM models indicate a downward behavior, but only model 5 is statistically relevant. For the post-crisis period I find downward behavior as well as significant results for all models.

After I analyzed the positive earnings management, the results for the negative error terms are listed in Table 5.

VARIABLES	(1) DECHO W	(2) KOTHAR I	(3) RAHMA N	(4) ABN_CF O	(5) ABN_PRO D	(6) ABN_DISEX P
SIZE	-0.081*** (0.024)	-0.071*** (0.022)	-0.306*** (0.042)	-0.0431 (0.031)	7.059*** (0.511)	2.323** (1.113)
LEV	0.0376*** (0.011)	0.0329*** (0.01)	0.144*** (0.02)	0.0051 (0.004)	-0.460*** (0.034)	-0.181 (0.289)
BIG4	-0.0071** (0.003)	-0.0064** (0.003)	-0.00327 (0.003)	0.0165*** (0.003)	0.0184*** (0.006)	-0.0145 (0.011)
GDP	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.0001** (0.000)	-0.0002** (0.000)	0.000 (0.000)
Before	0.0711*** (0.005)	0.0007 (0.004)	0.0009 (0.004)	0.0048 (0.004)	0.134*** (0.012)	-0.118*** (0.02)
During	-0.003 (0.004)	0.0672*** (0.003)	0.0627*** (0.003)	0.0697*** (0.004)	-0.0279*** (0.009)	-0.0227* (0.013)
After	-0.014*** (0.003)	-0.011*** (0.003)	-0.01*** (0.003)	-0.0017 (0.004)	-0.0101 (0.007)	0.0151 (0.012)
Industry fixed effects	NO	NO	NO	NO	NO	NO
Country fixed effects	NO	NO	NO	NO	NO	NO
Obs.	4,857	4,861	4,543	3,183	4,345	397

R-squared	0.11	0.1	0.18	0.18	0.45	0.31
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Standard errors in parentheses

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

Table 5: *Regression output of the negative earnings management of the whole time-period.*

As in the analysis before, I find upward behavior for all models in the pre-crisis period. This confirms my expectation and the first part of my hypotheses 2 and 3. However, I can find statistical significance at the 1% level for Model 1, 5 and 6. For the period During, I find statistically significant results for all models except for Dechow. Nonetheless, as in the previous analysis I find contradicting findings for the AEM models. Dechow has a positive coefficient, but as mentioned before it is not significant. The other two AEM models indicate an upward earnings management behavior. Kothari is again significant at the 1% level and positive. These results reject my hypothesis 1, because I was expecting a downward behavior. For the REM models I find upward behavior for Abn_CFO as well as Abn_Disexp and downward behavior for Abn_Prod. As a result, I can reject my hypothesis 2. For the post-crisis period, I find significance for all three AEM models. These imply a downward manipulation as I find in the previous output as well. Also, the REM models indicate a downward manipulation but with no meaningful relevance. However, due to the results of the previous output as well as the mentioned negative coefficients, I can reject my hypothesis 4.

4.5 Analysis of the whole Time-period (2005-2012)

After having analyzed the first part of my research question how firms manipulated their earnings in the different periods, I will concentrate on the drivers and their associated change in influence due to the economic shock. Thereby, I analyze first the whole-time span from 2005 – 2012 and afterwards each period individually.

The results of the regression for the time span of 2005 – 2012 is listed in Table 6.

VARIABLES	(1) DECHO W	(2) KOTHAR I	(3) RAHMAN	(4) ABN_CF O	(5) ABN_PRO D	(6) ABN_DISEX P
SIZE	-0.000 (0.001)	-0.0001 (0.001)	-0.000 (0.001)	0.0002 (0.001)	-1.341*** (0.356)	3.310** (1.457)
BIG4	-0.0071** (0.003)	-0.0039 (0.003)	0.0068*** (0.003)	0.0149*** (0.003)	-0.0266*** (0.007)	0.0613*** (0.017)
LEV	0.000 (0.001)	0.0002 (0.001)	0.000 (0.001)	-0.0001 (0.001)	0.0895*** (0.023)	-1.000** (0.412)
GDP	0.0001*** (0.000)	0.0001*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)

Industry fixed effects	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES
Obs.	8,488	8,501	8,206	8,517	7,263	791
R-squared	0.18	0.17	0.17	0.3	0.56	0.161

Standard errors in parentheses

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

Table 6: *Regression output of the Time span of 2005 – 2012.*

SIZE has a significantly negative impact on the manipulations of earnings on the abnormal production model and a significant negative effect on abnormal discretionary expenses model. The artificial sales model is not statistically relevant but has a positive coefficient. The results for the three AEM models are not significant but have a negative coefficient. Looking at BIG4 and its associated audit quality, the variable has significant influence on the dependent variables for all models except for the Kothari model. Moreover, the coefficients for AEM are all negative. This confirms the findings of Chi et al. (2010), who shows that audit quality has a positive impact on earnings quality and hence should be negative correlated to the dependent variables. However, BIG4 has a negative impact on overproduction as well as discretionary expenses model, while the artificial sales model is positively correlated to the manipulations of earnings. This contradicts the findings of Chi et al. (2010), who investigated that firms would switch to more costly REM, when AEM is constrained. Hence the REM models should be positive correlated to BIG4. All REM models are significant at the 1% level. LEVERAGE is only meaningful for model 5 and 6 and is positively correlated with ABN_PROD as well as ABN_DISEXP. The coefficients of the three AEM models are positive but not statistically significant. Although they are not meaningful it would contradict the findings of Anagnostopoulou and Tsekrekos (2017), who find that leverage constraints AEM. Nonetheless, it confirms their findings regarding REM, because the coefficients are positively correlated and hence enhances REM, when AEM is constrained. Although it contradicts my finding for model 4, this finding is negatively correlated but statistically not relevant. GDP had significant impact on the manipulations of earnings for all models of AEM as well as for the artificial sales model. All coefficients are positive but go close to zero.

4.6 Before the Financial Crisis of 2008 (2005 – 2007)

As mentioned before, to see the change in significance of the drivers and the associated impact of the crisis, I analyze the main drivers for each period individually. Below is the output from the regression of the period 2005 - 2007. The full results can be found in Appendix 3.

VARIABLES	(1) DECHOW_ B	(2) KOTHARI_ B	(3) RAHMAN_ B	(4) ABN_CFO_ B	(5) ABN_PROD B	(6) ABN_DISEXP B
SIZE	-0.187*** (0.063)	-0.170*** (0.056)	-0.0669 (0.062)	0.102 (0.063)	-0.261 (0.867)	2.457 (3.085)
BIG4	-0.0117** (0.006)	-0.0094* (0.005)	-0.0096** (0.005)	0.0203*** (0.006)	-0.0245* (0.014)	0.106*** (0.032)
LEV	0.0241*** (0.008)	0.0220*** (0.007)	0.0087 (0.008)	-0.0131 (0.008)	0.0566* (0.034)	-1.240 (1.008)
GDP	-0.000 (0.000)	-0.0001 (0.000)	-0.0001 (0.000)	-0.0002 (0.000)	0.0002 (0.000)	
Industry fixed effects	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES
Obs.	3,035	3,041	2,903	3,044	1,979	234
R-squared	0.42	0.34	0.24	0.33	0.65	0.235

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

Table 7: Drivers' coefficient output of the Time span of 2005 – 2007. LEV = LEVERAGE

Looking at SIZE, the results for the Dechow and Kothari models are highly significant and had the same negative impact on the manipulations as the whole time-period from 2005 to 2012. Before the crisis, SIZE had no statistically relevant influence on the three REM models and had negative influence for the models ABN_PROD as well as ABN_DISEXP, but a positive coefficient for ABN_CFO. The significance of the findings is different than for the whole period. For the time span of 2005 to 2012, I find statistical relevance for the REM models but not for the AEM. This has changed in respect to the pre-crisis period. Before the crisis, BIG4 was significant and negative correlated with manipulations of all models except for artificial sales. As in the preceding analysis, this is a confirming finding to previous literature, that firms with higher audit quality will lead to more conservative accounting choices. Next to that, as mentioned before, firms tend to switch to REM, when audit quality is high. I can confirm this finding except for model 5. As mentioned, only for the abnormal CFO model it shows a positive effect and has a significance on the 1% level. Unlike the output before, LEVERAGE is significant for the Dechow as well as for the Kothari model and shows a bigger positive coefficient. This contradicts the previous literature. High leverage should constrain AEM and enhance REM. The result for ABN_PROD model on the other hand, confirms the previous findings and it is statistically significant. In contrast to the previous output, GDP is not significant and shows negative influence on AEM.

4.7 During the Financial Crisis of 2008 (2008 – 2009)

Table 8 presents the regression results of the drivers. The results of the categorical variables as well as the standard errors can be found in Appendix 4.

VARIABLES	(1) DECHOW_ D	(2) KOTHARI_ D	(3) RAHMAN_ D	(4) ABN_CFO_ D	(5) ABN_PROD_ D	(6) ABN_DISEXP D
SIZE	1.221*** (0.470)	0.278 (0.223)	0.233 (0.219)	0.365 (0.241)	-1.260 (1.073)	2.041 (2.397)
BIG4	-0.0067 (0.006)	-0.0089 (0.005)	-0.0163*** (0.005)	0.0168*** (0.006)	-0.0337*** (0.013)	0.0477* (0.028)
LEV	0.0003 (0.03)	-0.001 (0.029)	-0.0284 (0.029)	-0.0877*** (0.032)	0.260*** (0.067)	-0.239 (0.646)
GDP	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000211 (0.000)	
Industry fixed effects	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES
Obs.	2,151	2,153	2,100	2,157	2,070	264
R-squared	0.36	0.38	0.5	0.38	0.66	0.188

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

Table 8: *Drivers' coefficient output of the Time span of 2008 – 2009. LEV = LEVERAGE*

Starting with SIZE, the coefficients are positive for AEM and only the Dechow model is significant at the 1% level. Hence, the influence of SIZE changed from negative to positive in respect to the pre-crisis output. Hence SIZE enhances AEM during the crisis but constrained before the crisis. The findings for the three REM models are like the ones before the crisis and stay meaningless. On the one hand, the coefficients of BIG4 for the AEM models stay negative, but on the other hand only the RahmanSharur model stays significant. For the models Dechow and Kothari, the coefficients lost significance and are therefore not statistically relevant anymore. The effect of financial distress is visible here. BIG4 lost on significance. For the REM models the influence did not change and all findings are meaningful. Hence it is a contradicting finding to Chi et al. (2010) for model 4. LEVERAGE lost its significance for AEM as well as changed the signs from positive to negative for the models 2 and 3 in comparison to the pre-crisis period. Although the findings are not significant, it would confirm that leverage constrains AEM. In contrast to the findings for the REM models, the influence is the same but gained relevance for the ABN_CFO as well as ABN_PROD model. The coefficients for GDP have decreased and their signs are the same as the previous output. However, no significance was found. The R-squared is nearly the same as the pre-crisis output.

4.8 After the Financial Crisis of 2008 (2010 – 2012)

Table 9 presents the regression results of the drivers. The results of the categorical variables as well as the standard errors can be found in Appendix 5.

VARIABLES	(1) DECHOW_ A	(2) KOTHARI_ A	(3) RAHMAN_ A	(4) ABN_CFO_ A	(5) ABN_PROD_ A	(6) ABN_DISEXP _A
SIZE	0.0003 (0.001)	0.0002 (0.001)	0.000 (0.001)	0.0002 (0.001)	-2.005*** (0.696)	7.021** (2.731)
BIG4	-0.0003 (0.004)	0.005 (0.003)	0.0021 (0.004)	0.0076* (0.004)	-0.0194* (0.01)	0.0466* (0.027)
LEV	-0.000 (0.001)	0.0001 (0.001)	0.000 (0.001)	-0.0001 (0.001)	0.132*** (0.045)	-1.351** (0.664)
GDP	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	
Industry fixed effects	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES
Obs.	3,302	3,307	3,203	3,316	3,214	293
R-squared	0.23	0.16	0.15	0.4	0.59	0.187

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

Table 9: Drivers' coefficient output of the Time span of 2010 – 2012. LEV = LEVERAGE

After the crisis, SIZE is statistically not relevant and has a positive correlation for all AEM models. In addition to that, the coefficients for these models decreased and went towards zero in comparison for the period during the crisis but stayed positive. This shows that SIZE did not regain importance after the crisis. Moreover, SIZE had a negative impact on AEM for the pre-crisis period but shows a positive correlation for the periods after. However, SIZE is statistically relevant and had a negative influence on the manipulations for the ABN_PROD as well as ABN_DISEXP model and thus gained importance in the post-crisis period. BIG4 was only statistically relevant to AEM before the crisis and had a negative impact on the manipulations for the first two periods. However, in the post-crisis period, BIG4 could not regain its importance for AEM and the influence has even turned positive for the Kothari as well as RahmanSharur model. This contradicts the previous literature. BIG4 is still significant for the REM models and has the same signs for the coefficients as before. While LEVERAGE is still not meaningful for the AEM models, it has changed its influence for them. The coefficients indicate a change from a positive effect to a negative effect on earnings management for Dechow and the opposite is the case for the other two AEM models. LEVERAGE is statistically relevant for the ABN_PROD as well as ABN_DISEXP and shows a positive effect on manipulations. Therefore, it contradicts previous literature findings that

LEVERAGE constraints AEM in respect to Models 2 and 3 but confirms the positive relationship to the last two models of REM. GDP is still not meaningful for all models, some coefficients changed their influence in comparison to the previous time-period. R-squared did decrease for the AEM models but stayed nearly unchanged for the REM models.

5. Conclusion

In this section I discuss my hypotheses and my results to give my conclusion as well as suggestions for further research. This dissertation investigates the behavior of earnings management in Europe and the influence of the Financial Crisis of 2008. Thereby, I analyze the manipulations of firms and the behavior of the drivers and its associated change of influence due to the economic shock.

My two first hypotheses relate to the firms' earnings management behavior during the crisis. Due to past literature, I was expecting a downward manipulation for AEM as well as REM, so that companies can obtain help from the state as well as a new negotiating position to creditors. In addition, I assumed that companies would try to show their true financial position in financial distress. Instead, according to my findings, I find upward behavior during the crisis for AEM. This implies, that I can reject my Hypothesis 1. For real earnings management practices, I find both upward as well as downward behavior during the crisis. Therefore, I reject Hypothesis 2 as well.

Hypotheses 3 and 4 were developed for pre-crisis and post-crisis behavior. I was expecting upward earnings management, in order to look more profitable before the crisis and to give a signal to stakeholders, that firms recovered from the crisis and hence show a lucrative financial position after the economic shock. Thereby, I was expecting upward behavior for both AEM as well as REM. Indeed, I find upward behavior in the pre-crisis period for all models. However, for the post-crisis period, I find downward behavior for AEM as well as REM. Therefore, I reject Hypothesis 3.

Hypothesis 5 covers the change in influence by the crisis of earnings management drivers. Thereby, I analyze each timespan individually and control for the impact of these drivers for each period. I find contradicting as well as confirming findings to previous research. Especially LEVERAGE on AEM showed contradicting findings in the pre-crisis period. It should constrain AEM, but the opposite was the case. Specifically, I find that the impact of these drivers changed due to the economic shock. Coefficients of drivers had opposite correlations

in the time periods. Also, the coefficients decreased after the pre-crisis period and increased in the post-crisis period. However, the economic shock was still visible in the post-crisis period. Next to that, the statistically relevance had movements as well. Most obviously, it can be seen in the BIG4 driver. It was negatively correlated and statistically relevant in pre-crisis period as previous literature suggested. During the crisis, the statistical significance suffered, especially for the AEM models. It turned even positive for the Models 2 and 3 but with no statistical significance. Although, many findings were not statistically meaningful, I find clear influence of the crisis on these drivers and I suggest that the crisis is responsible for the loss of significance for some results. Therefore, I accept the Hypothesis 5.

In general, the paper could confirm many previous findings. However, some of them are contradicting, which I suggest the majority have arisen as a result of the economic shock. Nonetheless, this could be further investigated through more statistical approaches. Next to that, previous literature examined more models for detecting earnings management, which could be used to find clearer results. Especially, LEVERAGE could be further analyzed due to contradicting findings to previous literature. To come to an end, this paper explored the clear economic shock on the drivers and hence the loss of significance for earnings quality.

6. Limitations and Suggestions

As all studies, this study has some limitations. Apart from the statistical relevance of my findings, my data sample is unbalanced. Observations for each industry vary greatly and observations for each country are different, too. Furthermore, as mentioned before, this sample lacks on observations for R&D as well as SG&A, which makes the model ABN_DISEXP often not relevant. As described in the conclusion, more earnings management models exist, therefore a further analysis on these models would get further findings. Lastly, experimentation with more statistical models is needed to confirm the robustness of my findings.

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8. Appendices

Appendix 1: *Country List*

<i>Vector</i>	GGISO code	Name	Obs.
1	AT	Austria	307
2	BE	Belgium	510
3	CZ	Czech Republic	61
4	DE	Germany	1425
5	DK	Denmark	198
6	ES	Spain	494
7	FI	Finland	321
8	FR	France	1582
9	GB	Great Britain	2107
10	GR	Greece	325
11	IE	Ireland	181
12	IT	Italy	706
13	JE	Jersey	17
14	LU	Luxembourg	12
15	NL	Netherlands	597
16	NO	Norway	271
17	PT	Portugal	332
18	SE	Sweden	394
19	SG	Singapore	7
			9847

Appendix 2: *Industry List*

<i>Vector</i>	ICBIC code	Name	Obs.
1	10	Technology	906
2	15	Telecommunications	378
3	35	Real Estate	1092
4	40	Consumer Discretionary	1991
5	45	Consumer Staples	943
6	50	Industrials	2772
7	55	Basic Materials	856
8	60	Energy	428
9	65	Utilities	481
			9847

Appendix 3: *Regression output pre-crisis period*

VARIABLES	(1) DECHOW B	(2) KOTHARI B	(3) RAHMAN B	(4) ABN_CFO B	(5) ABN_PRO D B	(6) ABN_DISEX P B
2.countryv	-0.0135 (0.0145)	0.00740 (0.0129)	0.0145 (0.0126)	0.0257* (0.0145)	0.0464 (0.0369)	0.0726 (0.0669)
3.countryv	-0.0204 (0.0302)	-0.0114 (0.0269)	0.00419 (0.0255)	0.0751** (0.0302)	0.0114 (0.0779)	
4.countryv	-0.00755 (0.0127)	-0.0146 (0.0113)	-0.00246 (0.0112)	-0.00646 (0.0127)	0.0197 (0.0313)	0.0608 (0.0531)
5.countryv	0.00951 (0.0180)	0.0120 (0.0160)	0.0200 (0.0156)	0.0210 (0.0180)	0.0491 (0.0490)	0.0831 (0.0790)
6.countryv	0.0232 (0.0151)	0.0246* (0.0135)	0.0286** (0.0132)	0.00776 (0.0151)	0.0213 (0.0392)	0.0260 (0.0905)
7.countryv	-0.00919 (0.0162)	0.0169 (0.0144)	0.0264* (0.0139)	-0.00976 (0.0161)	0.0546 (0.0408)	0.0247 (0.0688)
8.countryv	-0.0114 (0.0129)	-0.00173 (0.0114)	0.00321 (0.0113)	-0.00592 (0.0128)	0.102*** (0.0344)	0.0528 (0.0577)
9.countryv	0.00193 (0.0124)	0.00419 (0.0110)	0.0113 (0.0109)	0.00671 (0.0124)	-0.0107 (0.0338)	0.0539 (0.0529)
10.country v	0.0312* (0.0163)	0.0437*** (0.0145)	0.0562*** (0.0142)	-0.00425 (0.0163)	0.0333 (0.0431)	-0.0462 (0.0873)
11.country v	-0.00944 (0.0194)	0.00688 (0.0173)	0.0173 (0.0170)	0.0301 (0.0194)	0.0456 (0.0481)	0.0279 (0.0913)
12.country v	-0.00259 (0.0148)	0.00215 (0.0132)	0.0129 (0.0130)	-0.0191 (0.0148)	-0.0527 (0.0453)	0.138** (0.0609)
14.country v	0.0378 (0.0794)	-0.00725 (0.0706)	0.00936 (0.0665)	0.107 (0.0793)	-0.0194 (0.170)	
15.country v	-0.00598 (0.0141)	0.00746 (0.0125)	0.0132 (0.0122)	-0.00945 (0.0141)	0.0549 (0.0352)	0.127* (0.0730)
16.country v	0.0377** (0.0170)	0.0437*** (0.0151)	0.0477*** (0.0149)	-0.0136 (0.0169)	0.126*** (0.0439)	-0.0445 (0.0913)
17.country v	0.0210 (0.0166)	0.0229 (0.0148)	0.0175 (0.0147)	-0.0403** (0.0166)	0.173*** (0.0458)	
18.country v	-0.00110 (0.0153)	0.0165 (0.0135)	0.0253* (0.0132)	0.000132 (0.0152)	0.0482 (0.0381)	0.183*** (0.0624)
19.country v	-0.0112 (0.111)	-0.00265 (0.0987)	-0.00471 (0.0928)	-0.0290 (0.111)		
2.industry	-0.00650	-0.00807	-0.00645	0.0187	-0.0529	

	(0.0126)	(0.0112)	(0.0108)	(0.0126)	(0.0325)	
3.industry	0.0150	0.00668	-0.00237	-0.00607	-0.0226	
	(0.00946)	(0.00839)	(0.00807)	(0.00940)	(0.0253)	
4.industry	-0.00625	-0.00323	-0.00303	0.00372	0.0184	
	(0.00809)	(0.00720)	(0.00687)	(0.00808)	(0.0211)	
5.industry	0.00407	0.000383	-0.00211	-0.00483	-0.0272	0.136***
	(0.00942)	(0.00837)	(0.00799)	(0.00940)	(0.0244)	(0.0382)
6.industry	0.00161	-0.00108	-0.00612	-0.00848	0.0108	0.0906***
	(0.00779)	(0.00693)	(0.00664)	(0.00778)	(0.0205)	(0.0272)
7.industry	-0.0110	0.0127	0.00841	0.0106	-0.0218	0.136***
	(0.00968)	(0.00862)	(0.00829)	(0.00968)	(0.0254)	(0.0343)
	-					
8.industry	0.0839***	-0.0493***	-0.0174*	0.0424***	-0.0424	0.130***
	(0.0120)	(0.0107)	(0.0104)	(0.0120)	(0.0307)	(0.0448)
9.industry	0.00314	0.000687	-0.000299	0.0124	-0.0150	
	(0.0113)	(0.0101)	(0.00963)	(0.0113)	(0.0297)	
SIZE	-0.187***	-0.170***	-0.0669	0.102	-0.261	2.457
	(0.0627)	(0.0558)	(0.0619)	(0.0627)	(0.867)	(3.085)
LEV	0.0241***	0.0220***	0.00872	-0.0131	0.0566*	-1.240
	(0.00805)	(0.00717)	(0.00796)	(0.00805)	(0.0342)	(1.008)
	-					
BIG4	-0.0117**	-0.00942*	0.00960**	0.0203***	-0.0245*	0.106***
	(0.00560)	(0.00497)	(0.00482)	(0.00558)	(0.0143)	(0.0319)
GDP	-4.30e-05	-0.000119	-0.000108	-0.000187	0.000160	
	(0.000158)	(0.000140)	(0.000136)	(0.000157)	(0.000790)	
Constant	0.00828	0.00799	0.00264	0.0229	-0.0550	-0.238***
	(0.0198)	(0.0176)	(0.0172)	(0.0198)	(0.0851)	(0.0622)
Obs.	3,035	3,041	2,903	3,044	1,979	234
R-squared	0.42	0.34	0.24	0.33	0.65	0.235

Standard errors in parentheses

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

Appendix 4: Regression output during the crisis

VARIABLES	(1) DECHOW D	(2) KOTHARI D	(3) RAHMAN D	(4) ABN_CFO D	(5) ABN_PRO D D	(6) ABN_DISEX P D
2.countryv	0.0236*	0.0244*	0.0151	0.0210	0.0515	0.110*
	(0.0142)	(0.0142)	(0.0139)	(0.0153)	(0.0321)	(0.0620)
3.countryv	-0.0201	-0.0175	-0.0179	0.109***	-0.115*	
	(0.0294)	(0.0294)	(0.0288)	(0.0317)	(0.0683)	
4.countryv	0.0147	0.0119	0.00722	-0.00999	0.00942	0.0822*
	(0.0123)	(0.0124)	(0.0121)	(0.0133)	(0.0277)	(0.0486)
5.countryv	0.0408**	0.0420**	0.0331*	0.00829	0.0358	0.137**
	(0.0179)	(0.0179)	(0.0177)	(0.0193)	(0.0410)	(0.0672)

6.countryv	0.0203 (0.0143)	0.0163 (0.0143)	0.00728 (0.0140)	0.00838 (0.0154)	0.0155 (0.0321)	-0.0281 (0.0940)
7.countryv	0.0206 (0.0157)	0.0189 (0.0157)	0.0143 (0.0155)	-0.0231 (0.0170)	0.0534 (0.0355)	0.0228 (0.0611)
8.countryv	0.00984 (0.0124)	0.00823 (0.0124)	0.00302 (0.0121)	0.00491 (0.0134)	0.0746*** (0.0278)	0.0611 (0.0529)
9.countryv	0.00194 (0.0124)	-0.000339 (0.0124)	-0.00509 (0.0122)	0.00505 (0.0134)	0.0101 (0.0279)	0.0276 (0.0487)
10.country v	0.0340** (0.0159)	0.0305* (0.0159)	0.0227 (0.0156)	0.0142 (0.0171)	-0.00523 (0.0357)	0.0293 (0.0732)
11.country v	-0.0334* (0.0183)	-0.0341* (0.0183)	-0.0394** (0.0178)	0.0261 (0.0197)	-0.0472 (0.0413)	-0.0815 (0.0786)
12.country v	0.0268* (0.0137)	0.0280** (0.0137)	0.0239* (0.0134)	-0.0222 (0.0148)	-0.0499 (0.0308)	0.132** (0.0555)
13.country v	0.122*** (0.0418)	0.203*** (0.0418)	0.273*** (0.0408)	-0.0668 (0.0450)	0.156 (0.143)	
14.country v	0.00963 (0.0645)	0.00624 (0.0646)	-0.00458 (0.0631)	0.0789 (0.0696)	-0.150 (0.144)	0.0479 (0.149)
15.country v	-0.000508 (0.0139)	-0.00135 (0.0139)	-0.00862 (0.0136)	-0.00743 (0.0150)	0.0350 (0.0312)	0.00969 (0.0605)
16.country v	0.0157 (0.0166)	0.0133 (0.0166)	0.00149 (0.0164)	0.0126 (0.0179)	0.0733** (0.0373)	-0.0335 (0.0730)
17.country v	0.0334** (0.0155)	0.0315** (0.0155)	0.0270* (0.0153)	-0.0253 (0.0168)	0.142*** (0.0349)	
18.country v	0.0128 (0.0152)	0.00858 (0.0153)	-0.000735 (0.0149)	0.00166 (0.0164)	0.0681** (0.0343)	0.214*** (0.0569)
19.country v	0.0106 (0.0643)	0.0235 (0.0644)	0.0168 (0.0629)	0.0761 (0.0694)	-0.158 (0.143)	0.215 (0.151)
2.industry	0.0175 (0.0126)	0.0123 (0.0124)	-0.00215 (0.0124)	0.00116 (0.0134)	0.0297 (0.0284)	
3.industry	0.00769 (0.00900)	0.00419 (0.00890)	0.00170 (0.00882)	-0.0135 (0.00956)	0.0683*** (0.0212)	
4.industry	0.00827 (0.00797)	0.00617 (0.00787)	-0.00445 (0.00778)	-0.0123 (0.00848)	0.0687*** (0.0182)	
5.industry	0.0265*** (0.00930)	0.0210** (0.00920)	0.00934 (0.00912)	-0.00919 (0.00992)	0.0372* (0.0211)	0.0767** (0.0335)
6.industry	0.0209*** (0.00770)	0.0140* (0.00758)	0.00205 (0.00752)	-0.0154* (0.00817)	0.0635*** (0.0176)	0.0111 (0.0237)
7.industry	0.0207** (0.00945)	0.0165* (0.00931)	0.00946 (0.00928)	0.00692 (0.0100)	0.0277 (0.0217)	0.0689** (0.0306)

8.industry	0.0216*	0.0165	0.00202	-0.00792	0.0581**	0.0435
	(0.0116)	(0.0115)	(0.0114)	(0.0124)	(0.0264)	(0.0396)
9.industry	0.0280**	0.0201*	0.00460	-0.00186	0.0655**	
	(0.0113)	(0.0111)	(0.0109)	(0.0119)	(0.0256)	
SIZE	1.221***	0.278	0.233	0.365	-1.260	2.041
	(0.470)	(0.223)	(0.219)	(0.241)	(1.073)	(2.397)
LEV	0.000310	-0.000978	-0.0284	-0.0877***	0.260***	-0.239
	(0.0296)	(0.0293)	(0.0286)	(0.0315)	(0.0665)	(0.646)
			-			
BIG4	-0.00667	-0.00889	0.0163***	0.0168***	-0.0337***	0.0477*
	(0.00550)	(0.00543)	(0.00544)	(0.00586)	(0.0125)	(0.0277)
GDP	-5.34e-05	-3.69e-05	-6.35e-05	-2.94e-05	0.000211	
	(0.000116)	(0.000116)	(0.000115)	(0.000125)	(0.000262)	
	-					
Constant	0.0437***	-0.0308**	-0.00333	0.0132	-0.0903***	-0.121**
	(0.0148)	(0.0143)	(0.0141)	(0.0154)	(0.0336)	(0.0563)
Obs.	2,151	2,153	2,100	2,157	2,070	264
R-squared	0.36	0.38	0.50	0.38	0.66	0.188

Standard errors in parentheses

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

Appendix 5: Regression output post-crisis period

VARIABLES	(1) DECHOW A	(2) KOTHARI A	(3) RAHMAN A	(4) ABN_CFO A	(5) ABN_PRO D_A	(6) ABN_DISEX P_A
2.countryv	0.0112	0.00721	0.00597	0.0193	0.0657**	-0.00400
	(0.0104)	(0.00936)	(0.00915)	(0.0119)	(0.0269)	(0.0639)
3.countryv	0.0116	0.0128	0.0134	0.0605**	0.0177	
	(0.0211)	(0.0189)	(0.0183)	(0.0240)	(0.0538)	
4.countryv	-0.00122	0.00505	0.00512	-0.00371	0.0153	-0.000217
	(0.00918)	(0.00823)	(0.00806)	(0.0104)	(0.0235)	(0.0462)
5.countryv	0.00126	0.00947	0.0108	0.0307**	0.0270	0.0334
	(0.0132)	(0.0118)	(0.0116)	(0.0150)	(0.0345)	(0.0683)
6.countryv	-0.00407	9.91e-05	-0.000635	0.0120	0.0212	-0.0599
	(0.0108)	(0.00971)	(0.00951)	(0.0123)	(0.0278)	(0.0768)
7.countryv	-0.00778	0.000281	-0.000571	0.00134	0.0276	-0.0485
	(0.0116)	(0.0104)	(0.0102)	(0.0132)	(0.0299)	(0.0589)
8.countryv	-0.0102	-0.00648	-0.00595	0.0117	0.0912***	-0.0181
	(0.00908)	(0.00813)	(0.00794)	(0.0103)	(0.0233)	(0.0509)
9.countryv	-0.00428	-0.000562	-0.00180	0.0268***	-0.0136	0.0205
	(0.00891)	(0.00798)	(0.00780)	(0.0101)	(0.0228)	(0.0472)
10.country v	0.00857	0.0172	0.0237**	-0.00798	0.0368	-0.0443
	(0.0120)	(0.0107)	(0.0105)	(0.0136)	(0.0307)	(0.0739)
11.country v	-0.0242*	-0.0116	-0.0118	0.0354**	-0.0290	0.0308

12.country	(0.0137)	(0.0122)	(0.0118)	(0.0155)	(0.0352)	(0.0721)
v	-0.0139	-0.0107	-0.00536	-0.00827	-0.0455*	0.0408
	(0.0101)	(0.00906)	(0.00884)	(0.0115)	(0.0259)	(0.0535)
13.country						
v	-0.0673**	-0.0119	0.00422	-0.00374	0.0195	
	(0.0287)	(0.0257)	(0.0249)	(0.0326)	(0.0731)	
14.country						
v	0.0600*	0.0876***	0.0330	0.0471	-0.0133	-0.00398
	(0.0346)	(0.0310)	(0.0363)	(0.0393)	(0.0959)	(0.158)
15.country						
v	-0.0191*	-0.0155*	-0.0149	-0.00827	0.0318	-0.0153
	(0.0104)	(0.00927)	(0.00911)	(0.0118)	(0.0267)	(0.0569)
16.country						
v	0.00143	0.00464	0.00398	0.0233*	0.0364	-0.0752
	(0.0119)	(0.0107)	(0.0106)	(0.0136)	(0.0309)	(0.0729)
17.country						
v	-0.00389	-0.000762	0.00804	-0.0228*	0.152***	
	(0.0117)	(0.0104)	(0.0102)	(0.0132)	(0.0299)	
18.country						
v	-0.0110	-0.00412	0.000211	0.0242*	0.0465	0.208***
	(0.0110)	(0.00985)	(0.00967)	(0.0125)	(0.0283)	(0.0554)
19.country						
v	0.0548	0.0199	0.0213	0.110**	-0.176	0.169
	(0.0480)	(0.0430)	(0.0416)	(0.0546)	(0.122)	(0.159)
2.industry	0.00104	-0.00292	-0.00495	0.0246**	0.00756	
	(0.00889)	(0.00796)	(0.00793)	(0.0101)	(0.0232)	
3.industry	0.0229***	0.00555	0.00763	-0.00654	0.0493***	
	(0.00650)	(0.00582)	(0.00571)	(0.00735)	(0.0171)	
4.industry	0.00219	-8.35e-05	-0.00471	-0.00163	0.0633***	
	(0.00579)	(0.00519)	(0.00506)	(0.00657)	(0.0150)	
5.industry	0.0173**	0.0102*	0.00728	0.00273	0.0290*	0.0342
	(0.00680)	(0.00609)	(0.00594)	(0.00772)	(0.0174)	(0.0334)
6.industry	0.0142**	0.00655	0.00277	-0.00336	0.0506***	-0.00373
	(0.00556)	(0.00497)	(0.00487)	(0.00630)	(0.0144)	(0.0239)
7.industry	0.0163**	0.00744	0.00212	0.00474	0.0185	0.0822***
	(0.00687)	(0.00614)	(0.00604)	(0.00779)	(0.0178)	(0.0308)
8.industry	0.00169	-0.00854	-0.00463	0.0332***	0.0327	0.0377
	(0.00838)	(0.00750)	(0.00733)	(0.00951)	(0.0216)	(0.0401)
9.industry	0.0127	0.00801	0.00399	0.00778	0.0460**	
	(0.00816)	(0.00731)	(0.00709)	(0.00927)	(0.0210)	
SIZE	0.000304	0.000159	5.37e-05	0.000191	-2.005***	7.021**
	(0.00122)	(0.00109)	(0.00106)	(0.00139)	(0.696)	(2.731)
LEV	-2.09e-05	0.000118	9.70e-05	-0.000125	0.132***	-1.351**
	(0.000833)	(0.000746)	(0.000722)	(0.000947)	(0.0453)	(0.664)
BIG4	-0.000314	0.00496	0.00205	0.00759*	-0.0194*	0.0466*
	(0.00379)	(0.00340)	(0.00350)	(0.00431)	(0.00996)	(0.0273)
GDP	5.40e-05	-9.34e-06	-2.99e-05	7.79e-05	2.49e-06	
	(6.78e-05)	(6.07e-05)	(5.99e-05)	(7.69e-05)	(0.000175)	
Constant	-0.0169	-0.0174*	-0.00931	-0.00353	-0.0773***	-0.0707

	(0.0109)	(0.00975)	(0.00955)	(0.0124)	(0.0282)	(0.0543)
Observatio						
ns	3,302	3,307	3,203	3,316	3,214	293
R-squared	0.23	0.16	0.15	0.40	0.59	0.187

Standard errors in parentheses

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