Reporting Incentives and Capital Markets: Accrual-Based Earnings Management and Real Earnings Management in European Private and Public Firms

Master thesis Accounting, Auditing and Control

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Abstract:

This thesis investigates whether capital market pressure influences the degree to which firms engage in accrual-based and real earnings management. It does so by analyzing public and private firms from 13 countries within the European Union on the basis of eight earnings management measures for the years 2006-2015. The results suggest that private firms manage their earnings more and display lower quality earnings than their public counterparts. This appears to be the case for accrual-based as well as real earnings management.

Key words: Capital Markets, Accrual-based Earnings Management, Real Earnings Management, Private firms, European Union.

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1. Introduction

The purpose of this thesis is to examine the relation between capital market pressure and earnings management. In order to do this, the thesis will look at the relation between public & private firms from the European Union (EU) and multiple proxies for earnings management. The appendix includes Libby Boxes, which present a graphical overview of the research design. A distinction between private and public firms is made, because private firms are subject to different capital market forces than public firms. Private firms do not rely on capital markets for funding, but rather turn towards methods of private funding. This contrast between these two types of firms presents an opportunity to study the effects of capital markets. Europe is chosen as the continent of focus, since a lot of information is available for private as well as public firms. Additionally, both types of firms face similar accounting standards within the European Union. This thesis will attempt to answer the following research question:

> RQ: Do firms alter the degree to which they engage in earnings management in the absence of capital market pressure?

Prior research already investigated this topic. However, the evidence is still mixed and inconclusive and thus, there is no definitive answer to the research question posed. In addition to this, not much research has been done on this topic in the last decade. Burgstahler, Hail, and Leuz (2006) examine, among other things, if capital market pressures shape firms' incentives to report earnings that reflect economic performance. They find that private firms engage more in earnings management than public firms do. Their research is based on a sample period from 1997-2003. Since then, important changes in financial accounting have occurred, such as the mandatory introduction of IFRS for public firms. Changes like the introduction of IFRS, may result in their findings no longer holding in the present time. Developments in the economic landscape can also present reasons as to why different results may be expected nowadays. For example: a firms' financial information is now easier accessible to a wider audience than it was in the past. This may have shifted the incentives of managers to engage in earnings management and accordingly in a different way for private as opposed to public firms. The goal of this thesis is not to determine if and how such factors may have altered the results, but to investigate if the findings of Burgstahler

et al. (2006) still hold at the present time. This thesis will therefore focus on replicating the results of Burgstahler et al. (2006) (hereafter BHL) concerning their findings about capital market pressure. The same proxies for earnings management and the same control variables as in the original study will be researched in order to obtain a high amount of comparability with the initial study. Several OLS-regressions are performed in order to determine what type of firm engages more in earnings management.

BHL focus exclusively on accrual-based earnings management, as was common practice in the years they conducted their research. In the years after BHL conducted their research however, a lot of papers have examined the relation between *public firms and real earnings management* (e.g. Roychowdhury (2006), Cohen, Dey, & Lys, (2008) and Gunny (2010)). There are no studies examining the relation between *private firms* and real earnings management though. For this reason, the thesis will also incorporate this aspect. More specifically, not only does this thesis examine whether capital market pressure has an effect on the amount of accrual-based earnings management (hereafter AEM) firms engage in, it also examines if capital market pressure has an effect on the amount of real earnings management (hereafter REM) firms engage in.

This thesis makes no prediction as to whether or not private or public firms manage their earnings more. This is the case for AEM as well as REM. As stated above, prior research has found different results when researching the differences in AEM between public and private firms. It is therefore reasonable to expect either result as a possible outcome. In regard to REM, it sounds less plausible that private firms manage their earnings, as future firm value is being destroyed when resorting to REM. For public firms this may still be beneficial, since the improved financial reporting numbers can win over favorable views from the capital market. This incentive doesn't apply to private firms. However, REM is also harder to detect than AEM and public firms seem to be swapping out AEM for REM. It may therefore stand to reason that private firms engage in REM as well.

The same 13 countries, BHL investigate are examined in this thesis. These are countries there were part of the EU by the year 2003. The decision to examine these countries is made so that the results can be compared. The EU had 15 member states by the year 2003, however Luxembourg and Ireland were omitted from the initial research due to data constraints.

This research supports the findings of BHL when looking at AEM. The results indicate that private firms not only engage more in AEM, but also engage more in REM, than public firms.

Eight different measures, five for AEM and three for REM are used for the analyses. This includes an aggregated measure for AEM and REM. The measures are designed so that they may capture various earnings management practices, for example accrual manipulations for AEM and suspiciously low (abnormal) cash flows for REM. Only one measure, the magnitude of accruals relative to the magnitude of operating cash flows (AEM_2), signifies that public firms engage more in earnings management. The other seven, including the aggregated measures support the theory that private firms engage more in accrual-based as well real earnings management.

An important limitation of this study is that the sample size is significantly smaller than that of BHL and it is unclear why this is the case. The same database, Amadeus – supplied by Bureau van Dijk, is analyzed. Several theories are discussed as to why this is the case, the most plausible theory seems to be that less firms are categorized as independent firms within the database and non-independent firms are dropped from the sample.

This thesis aims to contribute to the earnings management literature by examining the differences in earnings management between private and public firms in a European setting in order to determine if capital market pressure has an effect on earnings management. This research helps contribute to the debate amongst academia on whether capital market pressure provides an incentive to engage in earnings management. The findings of this thesis are primarily of interest to regulators. If capital markets influence the reporting quality of firms than policy prescriptions should take this in to account. For example: capital markets aren't meant to function in a manner, in which managers deceive investors. If this is the case, than adequate policies need to be implemented by regulators.

2. Theoretical background

2.1 Accrual-based earnings management

The literature on earnings management is extensive. Initially the literature was primarily concerned with accrual-based earnings management and therefore whenever earnings management is discussed, it refers to accrual-based earnings management. Research conducted on real earnings management practices only became prevalent in more recent years. Whenever *real* earnings management is being discussed, it is always clearly stated so. While there is no definite definition of earnings management, Healy and Wahlen (1999) provide a definition for earnings management which is still widely used. They state:

‘‘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 (p. 368).’’

In addition to the above definition, Healy and Wahlen (1999) provide a comprehensive review of the earnings management literature. They observe that the primary focus of the literature has been on detecting whether and when earnings management occurs. Additionally, their findings indicate that there are several reasons as to why managers engage in earnings management, these include: influencing stock market perceptions, increasing management’s compensation, reducing the likelihood of violating lending agreements and avoiding regulatory intervention.

Earnings management appears to be relatively common according to the literature. For example, Burgstahler and Dichev (1997) estimate that 8%-12% of firms with small pre-managed earnings decreases manage their earnings upward. An even stronger relation is found for firms that have slight negative pre-managed earnings as 30-44% of firms manage their earnings upward. Dichev, Graham, Harvey and Rajgopal (2013) conduct a large survey among 169 Chief Financial Officers of public companies and find that in any given period the CFOs believe that 20% of companies are managing earnings. In a more recent study Dichev, Graham, Harvey and Rajgopal (2016) extend their previous research by incorporating CFOs of private firms in their sample. The

CFOs of private firms believe that as much as 30% of companies are managing earnings. Also, the CFOs of private firms believe that the magnitude of earnings management is larger.

In order to detect accrual-based earnings management several models have been developed and implemented. Two of the most commonly used models are the Jones Model (Jones, 1991) and the Modified Jones Model (Dechow, Sloan, & Sweeney, 1995). Both of these models calculate total accruals and estimate non-discretionary accruals in order to calculate the discretionary accruals. The discretionary accruals are used as a proxy for earnings management. Additionally, more variations of the Jones Model exist e.g. different performance-adjusted models. These are used in the literature to a lesser extent and are described and explained by Roonen and Yaari (2008).

Leuz, Nanda and Wysocki (2003) develop four proxies to measure earnings management, which are designed to capture a variety of earnings management practices and investigate whether firms in countries that have strong investor protection engage less in earnings management. Their findings are consistent with this notion.

Unfortunately, it is hard to correctly detect earnings management. Ball (2013) criticizes the earnings management literature and argues that regular business activities might be characterized as earnings management under the Jones Model. He argues that this reason, amongst others, has led researchers to believe that earnings management is more prevalent than it actually is. Dechow et al. (1995) test different earnings management models and conclude that all tested models have relatively low power for detecting earnings management of economically plausible magnitudes. It would appear however that these models are still widely used, because no better alternatives to measure earnings management have been suggested in the literature. As mentioned above, Dichev et al. (2013) estimate that 20% of firms manage their earnings, however Financial Executives also believe that only 10% of these earnings are being managed, resulting in an economy-wide rate of just 2%. Therefore, accrual models seem to overstate the amount of earnings management by a fair bit as Ball (2013) suggested. This may be a potential caveat to earnings management research in general.

2.2 The demand and opportunism hypotheses and capital market pressure

Prior studies argue that it is important to compare earnings management between private and public firms, because this may provide an answer on whether the "demand" hypothesis or the "opportunism" hypothesis rules in determining the financial reporting quality of firms (Ball and Shivakumar 2005; Givoly, Hayn, & Katz, 2010; Hope, Thomas, & Vyas, 2013). The demand hypothesis states that outsiders, such as shareholders, analysts and investors require high quality financial information in order to properly assess the company. If managers are motivated by this hypothesis, then they will provide high quality accounting information to inform these outsiders to the best of their abilities. This makes sense, because investors are more reluctant to supply capital to firms that have poor reporting quality (e.g. Chen, Hope, Li & Wang (2011)). Outsiders rely heavily on public financial statements of high quality, as this is the main type of information that is available to them.

Private firms do not have outsiders who rely on this accounting information and are able to communicate with shareholders via private channels. Thus, the demand hypothesis predicts that public firms provide higher quality financial information in comparison to private firms, since public firms have a stronger incentive to report high quality financial reports.

On the contrary, according to the opportunism hypothesis, public firms are more prone to agency conflicts and therefore, they will have lower quality financial reporting than private firms. Managers of public firms have incentives to manage earnings as they are under constant pressure by shareholders, analysts and investors to meet certain performance benchmarks. Many studies support this hypothesis (e.g. Burgstahler and Dichev (1997) and Dichev et al. (2013). Note that these hypotheses are not mutually exclusive.

Burgstahler, Hail and Leuz (2006) take in to account both of these hypothesis when referring to capital market pressure. Since private firms are prone to capital market pressure to a much lesser extent, they are more likely to have different reporting incentives. Their financial reporting may be influenced to a greater extent by debt covenants, taxation policies, dividend/bonus policies and/or other policies (Ball & Shivakumar, 2005; Givoly, Hayn, & Katz, 2010). Additionally, private firms are less likely to be exposed to litigation risk (Givoly et al., 2010). The existence of these incentives may imply that private firms have lower quality earnings than public firms.

2.3 Earnings management in private vs. public firms

Not a lot is known about private companies' financial reporting practices, even though private firms are the predominant type of organization in most countries (e.g. Ball & Shivakumar, 2005; Chen et al. 2011). Focusing on the United States, Asker, Farre-Mensa and Ljungqvist (2015) highlight the prevalence of private firms. They compile data from different sources, such as U.S. census data for businesses, CRSP and Compustat and estimate that in 2010 private U.S. firms were responsible for 52.8% of aggregate nonresidential fixed investments, 68.7% of private-sector employment, 58.7% of sales, and 48.9% of aggregate pretax profits. In addition, only 0,06% of all 5,7 million firms in the U.S. are estimated to be public firms. While it is true that most of these private firms are small in size, 86,4% of all firms with more than 500 employees were privately held in 2010. Accordingly, private companies also make up the majority of the EU economy (e.g. Ball & Shivakumar, 2005; Tendeloo & Vanstraelen, 2008). In contrast to the limited research on private firms however, the research on public firms has been quite extensive. One of the most likely reason that the focus of the literature is on public firms, as opposed to private firms, is the availability of data (Ball & Shivakumar, 2005; Coppens & Peek, 2005; Katz, 2009; Hope, Thomas, & Vyas, 2013).

More than a decade ago the studies of Ball and Shivakumar (2005) and Burgstahler et al. (2006) concluded that earnings of private firms are of lower quality in comparison to public firms in the U.K. and respectively Europe. Coppens and Peek (2005) demonstrate that private firms in Europe manage earnings. However, in contrast to public firms, private firms do not manage their earnings decreases, suggesting that some types of earnings management are due to capital market pressures. In contrast to the findings of Ball and Shivakumar (2005) and Burgstahler et al. (2006), Beatty and Harris (1999) and Beatty, Ke, and Petroni (2002) find that public banks manage their earnings more than private banks in a U.S. setting. Nichols, Wahlen and Wieland (2008) also examine public and private banks, but focus on the asymmetric timeliness of the recognition of losses versus gains in accounting income (conditional conservatism). They conclude that public banks report more conservatively than private banks do.

There has been little research on earnings management within *European* private firms in the last decade. However, research has been done on earnings in relation to private firms in other parts of the world. Hope et al. (2013) find that public firms have higher accrual quality and are

more conservative than private firms in the United States. In contrast, Kim and Yi (2006) show that publicly traded firms engage more in earnings management than private firms and thus, have lower earnings quality, analyzing firms in South-Korea. In support of their finding Givoly, Hayn, & Katz (2010) demonstrate that private equity firms have a lower propensity to manage earnings and have higher quality accruals compared to public equity firms in the U.S., whilst public equity firms report more conservatively. The private equity firms they study have public debt and therefore they must report to the SEC in the same manner that public equity firms do. Katz (2009) also analyzes the differences between public equity and private equity firms. She focusses on earnings quality and long-term performance and finds that public equity firms have higher earnings quality, engage in less earnings management and report more conservatively both prior to and after an IPO.

Some private firms may be subject to insider control. Gopalan and Jayaraman (2012) examine earnings management between insider controlled firms and noninsider controlled firms in different institutional settings. They find that insider controlled firms engage *more* in earnings management than noninsider controlled firms in countries with weak investor protection. Only weak evidence is found for insider controlled firms engaging in *less* earnings management in countries with strong investor protection.

Furthermore, different topics closely related to earnings management in European private firms have also been researched. These include topics such as: auditor relations, earnings smoothness and earnings timeliness. Tendeloo and Vanstraelen (2008) examine the relation between earnings management and audit quality in European private firms. They report that Big 4 audit firms (considered to be high quality audit firms) constrain earnings management more, relative to non-Big 4 audit firms, but only in countries with a high tax alignment. Consistent with the results of Burgstahler et al. (2006) they also find that private companies located in countries with strong legal systems engage *less* in earnings management. Concentrating on the smoothness of earnings, Gassen and Fülbier (2015) find that European private firms report smoother earnings streams when they have larger shares of creditor financing. Peek, Cuijeprs and Buijink (2010) examine how creditors' and shareholders' reporting demands affect the asymmetric timeliness of earnings in private and public firms in Europe. They demonstrate that creditors of public firms demand asymmetric timeliness of earnings, whilst creditors of private firms do not make such a strong demand.

TABLE 1
Results from previous studies indicating if private or public firms have lower earnings quality and/or engage more in earnings management.

Papers	Public firms have lower earnings quality / engage in more earnings management than private firms.	Private firms have lower earnings quality / engage in more earnings management than public firms.
Beatty & Harris (1999)	✓	
Beatty et al. (2002)	✓	
Ball & Shivkumar (2005)		✓
Burgstahler et al. (2006)		✓
Kim and Yi (2006)	✓	
Katz (2009)		✓
Givoly et al. (2010)	✓	
Hope et al. (2013)		✓

Until this day the evidence on what type of firms engages more in earnings management remains mixed and inconclusive. The literature hasn't clearly shown if private or public firms are more likely to engage in earnings management. Therefore, it isn't clear if capital market pressure influences earnings management and in what direction. This research remains important, because if capital market pressure influences earnings management, then private and public firms potentially have different incentives to report high- or low-quality earnings. In turn, it may therefore not make sense to have universal accounting reporting standards for public and private firms.

Lastly, in order to structure the literature above, table 1 is provided, which attempts to give an overview of the results of the most important literature discussed above. In this table the findings of the papers concerning earnings quality / the degree of earnings management between private and public firms is organized. This overview is a generalization of the results from the different studies, when closely examining these studies different conclusion may be drawn in specific settings (e.g. when focusing on different institutional factors). Only literature that specifically discusses the differences between public and private firms is included in the table. Therefore studies such as Gopalan and Jayaraman (2012), which focus on insider controlled and non-insider controlled firms, are omitted from the table.

2.4 Real earnings management

In recent years there have been several studies observing public firms engaging in real earnings management (e.g. Roychowdhury, 2006; Cohen, Dey, & Lys, 2008). On the contrary, to my knowledge, there are no peer-reviewed / high-quality studies that examine the differences in real earnings management practices between public and private firms or even studies examining real earnings management in private firms specifically. This may be an important gap in the literature as this paragraph will discuss. Cohen et al. (2008) document that public firms have been increasing the extent to which they engage in real earnings management. In particular they find that public firms started to engage more in real earnings management after the passage of the Sarbanes-Oxley Act (SOX) of 2002. Real earnings management is also harder to detect than accrual-based earnings management (Graham, Harvey and Rajgopal, (2005); Cohen et al., 2008), this may explain a switch from accrual-based earnings management to real earnings management post SOX. Zang (2012) finds that public firms switch between accrual based earnings management and real earnings management, based on their relative cost to one another and the actual realization of the real earnings manipulations. Thus, there are strong incentives for firms to engage in real earnings management. It may therefore be worthwhile to examine if private firms engage in real earnings management as well and if so, to what degree.

Real earnings management distinguishes itself from accrual-based earnings management in the sense that "real" earnings management arises from actions that deviate from normal business practices and are taken in order to meet certain earnings benchmarks (Roychowdhury, 2006). Accrual-based earnings management doesn't affect cash flows directly, but real earnings management does. Examples of earnings management may be: cutting R&D-expenditures, decreasing marketing-expenses or temporarily decreasing sale prices. This poses a potential concern, because long-term firm value is now being sacrificed in order to enhance financial reporting in the short-term.

Different methods to engage in real earnings management exist. Surveys distributed and analyzed by Graham, Harvey and Rajgopal (2005) demonstrate that more than half of the Chief Financial Officers surveyed would engage in real earnings management by decreasing discretionary spending (reducing R&D costs, reducing advertising costs or reducing maintenance costs) or by delaying the start of a new project in order to meet earnings benchmarks. They even

find that some managers will forego projects that have a positive net present value in order to meet analysts' earnings forecasts. Their evidence suggests that financial executives prefer real earnings management over accrual-based earnings management, since it is harder to detect for outsiders. Gunny (2010) finds that real earnings management is positively associated with firms just meeting earnings benchmarks (analysts' forecasts and last year's earnings). Additionally, her results indicate that firms engaging in real earnings management have relatively better subsequent performance compared to firms that do not engage in real earnings management. This suggest that real earnings management is not necessarily negative for the firm in the long run.

3. Hypotheses development

3.1 Hypothesis 1

This thesis aims to provide an answer as to whether or not capital market pressure facilitates accrual-based and real earnings management. Capital market pressure is already documented to affect certain managerial behaviors, for example, Bhojraj and Libby (2005) show that there is a link between capital market pressure and myopic managerial behavior. In order to measure capital market pressure, it is necessary to distinguish between firms that are subject to this kind of pressure and firms that aren't, while keeping other factors constant. This distinction can be found between private and public firms. Private firms have privately owned equity, so they don't face any capital market pressure, whilst public firms have publicly owned equity and thus, they do face capital market pressure.

There exist opposing arguments as to which type of firm is expected to have higher financial reporting quality. Most prior research argues that private firms should have lower financial reporting quality than public firms. The most common explanation for this would be that the demand for high quality financial information of private firms is lower, since private firms already communicate their earnings via various private channels (Ball et al., 2005; Burgstahler et al., 2006; Chen et al., 2011). This means that private firms lack the incentive to report informative high quality earnings in annual reports, because there is no demand for this information. Therefore, private firms may have different goals in mind when reporting earnings, e.g. minimizing taxes or determining dividend payments (Ball et al. 2005; Burgstahler et al., 2006). Having these or similar goals may incentivize private firms to manage their earnings.

Public firms are subject to capital market pressure and therefore they have outside parties that are interested in high quality financial reporting. However, public firms also have enough incentives to manage earnings. Since they face capital market pressure, they may: manage earnings prior to an IPO, manage earnings prior to a management buyout, manage earnings to meet expectations of financial analysts or management and manage earnings to influence expectations of specific types of investors (Healy et al., 1999). Dichev et al. (2013) find that more than 90% of CFOs believe that companies manage earnings to influence their stock price, as well as manage earnings due to outside and inside pressure to hit earnings benchmarks.

Additionally, both private and public firms may manage earnings in order to: increase the compensation and job security of managers, avoid the violation of lending contracts, reduce regulatory costs and increase regulatory benefits (Healy et al., 1999).

It can be concluded that both private and public firms have multiple incentives to manage earnings. As Burgstahler et al. (2006) have already stated, it is not clear whether these incentives create a differential effect and how prevalent they are. In order to determine if incentives coming from capital markets incentivize public firms to manage earnings more or less relative to private firms, we need to compare the two types of firms. As can be concluded, the literature provides no clear predictions as to what type of firm engages more in earnings management. Therefore, hypothesis 1 is two-sided and stated in the following manner:

H1: Public and private firms engage in a different amount of *accrual based* earnings management.

3.2 Hypothesis 2

The first hypothesis specifically focusses on accrual-based earnings management. As mentioned in chapter 2, public firms also have incentives to engage in real earnings management and some act accordingly. It is unknown however if private firms also engage in real earnings management. It is unknown, because no studies as of yet have examined this relation. This thesis will try and fill in the gap.

If public firms engage in accrual-based earnings management due to capital market pressure, it stands to reason that they will also engage in real earnings management, especially since it's harder to detect, making it a better instrument to mislead investors and shareholders. The idea that public firms engage in accrual-based and real earnings management has been discussed in chapter 2 (e.g. Healy and Wahlen (1999), respectively Roychowdhury (2006)). The problem with real earnings management is that it destroys long-term firm value while accrual-based earnings management doesn't. For example, a company may cut R&D costs or advertising costs to manage earnings, but in the long run this will damage the firm financially, since these are value creating activities for the business in the long term.

Logically it would make less sense for private firms to engage in real earnings management. Real earnings-management has negative long-term consequences, as future value is being sacrificed for present value. Any (financial) benefits obtained in the present will therefore be offset in the future. This strategy can make sense when it is applied due to capital market pressure, because favorable views from the capital market may outweigh the negative effects of the destruction of future value. Though, it makes less sense when it is applied for other reasons, since now there is only value destruction with no accompanying benefit (no favorable market view, from misled investors). Take reducing maintenance expenses as an example: by engaging in real earnings management these expenses may be reduced in the present, resulting in higher reported earnings in the short-term. In the long-term however, machinery might break down sooner, resulting in lower earnings in the long run. In the end the firm will be worse off in total. This may not necessarily be the case for public firms as real earnings management may help meet EPS forecast's; therefore convincing investors and shareholders to keep supporting the firm; which will increase share price & reduce the cost of capital and thus the firm may be better off long-term. The benefits of being looked upon favorably by the capital market outweigh the disadvantages of the value destruction. This is consistent with Gunny (2010) who demonstrated, that firms engaging in real earnings management to meet earnings benchmarks attain benefits that allow better future performance.

A counter argument that can be presented is that the study of BHL, demonstrates that private firms engage more in accrual-based earnings management. Combine this with the research of Cohen et al. (2008) who show that (public) firms have been swapping out AEM for REM and the idea is borne that private firms may do the same. As discussed above, the reasons for this seem less probable, as private firms do not seem to have good incentives to engage in REM. However, there may be incentives which are not immediately considered (e.g. private firms also notice that AEM is easily detected and therefore prefer to use REM).

In order to investigate the theory outlined above a hypothesis is formulated that doesn't make any predictions about what type of firm engages more in *real* earnings management. The second hypothesis therefore takes the following form:

H2: Public and private firms engage in a different amount of *real* earnings management.

4. Research design

4.1 Accrual-based earnings management proxies

As this thesis will be partially replicating the study of BHL, identical proxies will be used in order to measure any accrual-based earnings management. These proxies originate from previous research and are first brought together in the study performed by Leuz et al. (2003). These proxies are: (AEM_1) the tendency of firms to avoid small losses, (AEM_2) the magnitude of total accruals, (AEM_3) the smoothness of earnings relative to cash flows and (AEM_4) the correlation between accounting accruals and operating cash flows. In order to reduce the potential measurement error of the individual proxies, they will also be examined when averaging them into an aggregate index of earnings management, denoted AEM_{aggr}. In order to determine if public or private firms engage more in AEM, OLS-regressions are run on all of these proxies.

The first proxy, the tendency of firms to avoid small losses (AEM_1), will now be discussed in greater detail, followed by the other four proxies. The tendency of firms to avoid small losses is measured by looking at the occurrence of small profits relative to small losses. The intuition behind this proxy is that firms may use their accounting discretion to transform small losses in to small profits and thus firms that engage in earnings management have relatively more small profits than small losses.

A firm-year observation is classified as a small profit or a small loss if the positive, respectively, negative after-tax net income falls within the range of 1 percent of lagged total assets. The following regression is run for AEM_1:

$$AEM_1 = \alpha + \beta 1 PUBL + \beta 2 Control1 + \beta 2 Control2 + \cdots + \varepsilon \qquad (1)$$

The independent variable PUBL is a dummy variable indicating whether a firm is either public or private, with β1 being the coefficient of interest. Several control variables are incorporated in the equitation, which are discussed in paragraph 4.3.

AEM_2, the magnitude of accruals relative to the magnitude of operating cash flows, can be computed as the median ratio of the absolute value of total accruals scaled by the corresponding value of cash flow from operations[1]. The following regression is run for AEM_2:

$$AEM_2 = \alpha + \beta 1PUBL + \beta 2Control1 + \beta 2Control2 + \cdots + \varepsilon \quad (2)$$

The independent and control variables are the same as in equation 1.

AEM_3, the smoothness of earnings relative to cash flows, can be computed as the ratio of the standard deviation of operating income divided by the standard deviation of cash flow from operations, multiplied by -1, so that higher values correspond to more earnings smoothing. For equations 1 and 2, higher values correspond with more earnings management by default. The following regression is run for AEM_3:

$$AEM_3 = \alpha + \beta 1PUBL + \beta 2Control1 + \beta 2Control2 + \cdots + \varepsilon \quad (3)$$

The independent and control variables are the same as in equation 1 and 2.

AEM_4, the correlation of accounting accruals and operating cash flows, can be computed as the Spearman correlation between changes in total accruals and changes in the cash flow from operations (both scaled by lagged total assets). AEM_4 is also multiplied by -1 so that higher values once again indicate higher levels of earnings management. The following regression is run for AEM_4:

$$AEM_4 = \alpha + \beta 1PUBL + \beta 2Control1 + \beta 2Control2 + \cdots + \varepsilon \quad (4)$$

The independent and control variables are the same as in equations 1, 2 and 3.

[1] In order to calculate the cash flow from operations, a balance sheet approach is used, since cash flow statements are generally not available for private and public European firms. Cash flow from operations is equal to Net Income – Total Accruals. Total accruals are computed following the method of Dechow et al. (1995). They calculate the accrual component as follows:

Accruals= (Δtotal current assets - Δcash - Δtotal current liabilities + Δshort-term debt - depreciation expense) / lagged total assets.

Lastly, AEM_{aggr} is computed as a summary measure of the previous four proxies. This is done by constructing an average percentage rank across all individual proxies, where a higher number for an earnings management proxy, results in a corresponding higher ranking. Then, a mean rank is calculated based on these percentage ranks for every country-industry-group to create AEM_{aggr}. The following regression is run for AEM_{aggr}:

$$\text{AEM}aggr = \alpha + \beta 1 PUBL + \beta 2 Control1 + \beta 2 Control2 + \cdots + \varepsilon \quad (5)$$

The independent and control variables are the same as in equations 1, 2, 3 and 4.

4.2 Real earnings management proxies

Proxies that have been well-established in prior research will be used in order to measure real earnings management. In order to measure REM, the model originally developed by Dechow, Kothari and Watts (1998) will be used. This model is implemented in for example Roychowdhury (2006) and Cohen et al. (2008). These papers use three REM proxies, which are: the abnormal levels of cash flows from operations (CFO), abnormal production costs and abnormal discretionary expenses. This thesis will only use the first two proxies, since Amadeus doesn't contain sufficient information in order to calculate discretionary expenses. Abnormal cash flows from operations are labeled as REM_1 and abnormal production costs are labeled as REM_2. REM_1 and REM_2 are calculated as the difference between the "normal levels" and the actual values of cash flows from operations, respectively production costs. The intuition behind these proxies is that firms that manage their earnings upward have remarkably low cash flows from operations and/or remarkably high production costs. These firms may have low cash flows, because sales are increasing due to activities that aren't normal for the way business is conducted (e.g. over-use of excessive sales to boost revenue). This will temporarily boost sales, but decrease long-term firm value. Managers may also manage earnings upward by increasing production. More production means that managers can divide overhead costs amongst more units, thus decreasing the cost per unit. This suggests that the reported COGS will be lower and thus, the firm can report better operating margins and a higher profit. The additionally produced goods may not be sold in the next period, resulting in a net loss over a longer period.

First and foremost, the abnormal cash flows need to be calculated. This can be done by first calculating the "normal" cash flows and then by subtracting these normal cash flows from the actual CFO (the same is done for production costs and discretionary expenses, see equation 7 and 8). The abnormal CFO is calculated using the following regression:

$$\frac{CFO_t}{ASSETS_{t-1}} = \beta_0 + \beta_1 \left(\frac{1}{ASSETS_{t-1}}\right) + \beta_2 \left(\frac{SALES_t}{ASSETS_{t-1}}\right) + \beta_3 \left(\frac{\Delta SALES_t}{ASSETS_{t-1}}\right) + \varepsilon_t \quad (6)$$

Just as with the accrual-based earnings management measures, the actual cash flow from operations needs to be calculated using a balance sheet approach, once again the approach of Dechow (1995) is followed. CFO_t is scaled by lagged total assets ($ASSETS_{t-1}$). In this model $ASSETS_t$ are the total assets at the end of period *t*, $SALES_t$ are the sales during period *t* and $\Delta SALES_t$ is the change in sales since the previous period (so $SALES_t - SALES_{t-1}$). These variables are also used in equation 7. With these variables the normal CFO is estimated. The abnormal CFO is then equal to the residual ($\mathcal{E}_t$), since the normal CFO and abnormal CFO together make up the actual CFO.

Once the abnormal CFO is calculated it is possible to run a regression on this variable. The coefficients of this regression will indicate if public or private firms engage more in real earnings management. Similar to with the EM proxies, the regression takes the following form:

$$REM_1 = \alpha + \beta 1 PUBL + \beta 2 Control1 + \beta 2 Control2 + \cdots + \varepsilon \quad (7)$$

In this regression REM_1 is the abnormal CFO multiplied by -1 so that higher values correspond with more earnings management. The independent and control variables are the same as in the AEM measures.

Next, $PROD_t$ are the production costs and can be defined as the sum of the cost of goods sold ($COGS_t$) and the change in inventory in period *t* (ΔINV_t). Unfortunately, Amadeus doesn't provide information on COGS for many companies, however BHL calculate COGS by taking the total revenue and subtracting the operating income. BHL use COGS in order to calculate a control variable (operating cycle), as discussed in the upcoming paragraph. Therefore, in order to calculate the actual production costs, COGS will be calculated in the same manner. In order to calculate the abnormal production costs, the following regressions is used:

$$\frac{PROD_t}{ASSETS_{t-1}} = \beta_0 + \beta_1 \left(\frac{1}{ASSETS_{t-1}}\right) + \beta_2 \left(\frac{SALES_t}{ASSETS_{t-1}}\right) + \beta_3 \left(\frac{\Delta SALES_t}{ASSETS_{t-1}}\right) + \beta 4 \left(\frac{\Delta SALES_{t-1}}{ASSETS_{t-1}}\right) + \varepsilon_t \quad (8)$$

The normal production costs are estimated using the same variables as in equation 6. There is however an additional variable, which is the lagged change in sales since the previous period (so $SALES_{t-1}$ - $SALES_{t-2}$). Also, in the same manner as with equation 6, the abnormal production costs are equal to the residual ($\mathcal{E}_t$).

Now that the abnormal production costs are known, it is possible to run a regression on these costs in order to determine of public or private firms engage more in real earnings management.

$$REM_2 = \alpha + \beta 1 PUBL + \beta 2 Control1 + \beta 2 Control2 + \cdots + \varepsilon \quad (9)$$

In this regression REM_2 represents the abnormal production costs. The independent and control variables are the same as in the AEM measures.

Lastly, in concordance with Burgstahler et al. (2006) and Cohen et al. (2008), an aggregated proxy for REM is computed. Cohen et al. (2008) compute an aggregated proxy for REM, which is the sum of the three standardized variables: abnormal CFO, abnormal production costs and abnormal discretionary expenses. This method is not followed. In the previous paragraph, Burgstahler et al. (2006) use an average percentage rank across all individual proxies in order to compute EM_{aggr}. This method will be followed, in order to maintain consistency in the research design. In a similar fashion as with EM, the average percentage rank across both REM proxies is computed. Then, the mean rank is calculated for every country-industry-group based on these percentage ranks to create $REM_{aggr.}$. Now there is an aggregated proxy for accrual-based earnings management as well as real earnings management. The following regression is run for REM_{aggr}.

$$\text{REM}aggr = \alpha + \beta 1 PUBL + \beta 2 Control1 + \beta 2 Control2 + \cdots + \varepsilon \quad (10)$$

All AEM proxies are run on country-industry-groups, in order to keep up with the consistency of the AEM proxies, the REM proxies are constructed in such a manner that they align

with the AEM measures. In order to do this all the above proxies are constructed in a similar fashion as AEM_2, which means that the median CFO and the median production costs of each country-industry-group are used in the regression.

4.3 Data, Sample Selection and Descriptive Statistics

The database that is being analyzed is Amadeus, which is supplied by Bureau van Dijk. This database contains financial statement information on European public, as well as private firms. Information is retained for a period of up to 10 years. The entire database is downloaded for all countries, with the exception of firms that report missing total assets. This is done so that the overall sample size decreases immediately.

This research is conducted on a ten-year period from 2006 to 2015. Whenever a new firm year is added, the oldest one is dropped from the database. As a consequence the data for the year 2006 is significantly smaller than for other years. Other years are relatively similar in size, whilst 2006 is roughly half the size of the other years. Amadeus offers consolidated financial statements when the corporate group has multiple corporations, otherwise parent-only financial statements are provided. The main advantage of Amadeus over other databases is that it provides the financial statements of European public as well as private firms.

In order to compare the obtained results with those of BHL, it is necessary that their methodology be followed as closely as possible. If this is not done after all, we can't conclude that any differences that occur are due to differences arising from different sampling periods (which this thesis aims to confirm or refute) or due to a different methodology being used. That being said, it is sometimes not possible to exactly replicate the research by BHL. Whenever differences arise, this will be clearly indicated.

The initial sample contains all firm-year observations from private and public firms that have their legal home in one of the 15 member states of the EU by the year 2003. These are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and The United Kingdom. However, BHL dropped Ireland and Luxembourg from their initial sample, as these countries did not provide required data on operating income and depreciation expenses. This thesis therefore, does the same, so that 13 countries are examined. Small firms are excluded from the sample, by incorporating size

restrictions. Firms are required to have: (1) total assets greater than EUR 2.5 million, (2) sales greater than EUR 5 million and (3) number of employees greater than 50. Furthermore, banks, insurance companies and other financial holdings (3-digit SIC codes between 599 and 680), as well public administrative institutions (3-digit SIC codes above 899) are omitted from the sample. These types of companies are often vastly different from other firms and therefore potentially alter the results.

Privately held subsidiaries of quoted companies are also excluded from the sample, since they are likely to be influenced by their parent companies, thus biasing the results. These are all firms that have an independence indicator of either C, D or U. Having one of these indicators means that another firm owns at least 50% of the firms' shares or that a firms' independence is unknown (U). Firms where no independence letter is reported are also omitted, since this can be viewed as having an unknown independence.

Moreover, private firms that aren't corporations (or have a similar status, including national equivalents) are dropped from the sample. This is because private firms that aren't corporations do not necessarily face the same accounting rules as public firms, whilst private firms that are corporations do face similar rules.

Next, we arrive at the first difference between BHL and this thesis. In their research, they delete firms that go public during the sample period. This is because prior work, such as that of Teoh, Welch and Wong (1998), suggests that firms that go public exhibit systematically higher levels of earnings management. Amadeus however, only displays if a firm is currently public or private and doesn't show any changes that happened during the sample period. A firm that is now public, but was private in prior years, is displayed as being public in those prior years as well. BHL use an older sample of the database in order to pinpoint firms that have an IPO during their sample period. Unfortunately for this thesis, no older sample is available and so, such an exercise can't be performed. This however doesn't seem to be an issue as BHL found very similar results between datasets that incorporated and excluded these IPO firms.

Now that all steps are taken in order to create a dataset that contains similar firms as those used by BHL, the next step is to winsorize all relevant accounting items in order to mitigate the influence of any outliers. The data is winsorized at the 1st and 99th percentile for the following accounting items: cash & cash equivalents, current assets, current liabilities, debtors, depreciation, inventory, loans, net profit, operating profit, sales and total assets. BHL truncate these accounting

items, but as the dataset being used in this thesis is already smaller in size, the data is winsorized as not to lose any more observations. If firms have some accounting items that are exactly equal to zero, such as total assets and net profit, these companies are treated as having missing values and are also deleted from the sample. Lagged total assets, are required in the calculation of several proxies and control variables, as a result the first firm-year is not included in the analysis.

Lastly, when calculating the earnings management proxies, some results inevitably turn out to be zero or empty. This happens when in calculating a proxy, a number is divided by zero or zero is divided by a number. These observations are dropped from the sample, as empty values can never be incorporated in a regression by default and therefore if observations with a zero aren't dropped, than the results are biased towards only one extreme. This is the case for just a few observations.

The accrual-based earnings management proxies by Leuz et al. (2003) are constructed in such a manner that they need to be computed for a group of firms. Leuz et al. (2003) use country-level observations. This means that firms are grouped together per country. BHL go one step further and use industry-level classifications within each country. Naturally, this thesis follows their method. There are several methods to create different industry classes. A widely used method is to use two-digit SIC codes, as for example, Cohen et al. (2008) do. Other industry classifications that exist are the widely popular 48 industry classifications of Fama & French (1997) and a 12 industry classification by Campbell (1996). BHL use the classification of Campbell (1996), so for, by now obvious reasons, this classification is also used in this thesis.

The classification of Campbell groups certain firms together, based on their SIC-codes. The classification of Campbell however leaves certain firms uncategorized. It doesn't account for firms with a three-digit SIC-code between 020 and 100, for this reason a 13th category is created, which is fundamentally an agriculture sector.[2] This gives a possibility for 338 observations (13 countries x 12 industry classes x 2 firm types) for both the accrual-based earnings management and real earnings management proxies. In actuality one sector is already omitted, which is the finance / real estate industry (Campbell classification), since 3-digit SIC codes between 599 and 680 are already deleted. Thus, there are 312 potential observations (13 countries x 12 industry classes x 2 firm types). These observations will be referred to as country-industry-groups.

[2] BHL also mention that not all observations are accounted for. They also group these firms together in a separate industry class. Their results remain unchanged when this group is deleted from the analysis.

A minimum of ten firm-year observations per unit of analysis is required. This means that country-industry-classes with less than ten observations are dropped from the sample. This leaves a *final sample size of 134,180 firm-years, with a total of 189 country-industry-groups of which 121 are private and 68 are public*. Table 2 provides a full breakdown of the amount of firm-years and the amount of industry-groups per country and per listing status.

This size of the sample immediately means that a big caveat of this thesis must be noted, because BHL report a final sample size of 378,122 firm-years. It is not directly clear from where this massive difference arises. To further analyze this difference, another dataset containing the years 2007-2016 is reviewed. In this dataset the final sample size is even smaller. Not only is the final sample smaller, also the initial sample (without any adaptations) decreased compared to the sample used in this thesis. There are several theories as to why the dataset is shrinking. First, BHL report that they used a relatively new database, which might suggest that there were still problems and errors within Amadeus in the years they used it. These issues may now have been resolved, resulting in a different dataset. Second, it seems that the sample size is increasingly declining due to the exclusion of firms with an independence indicator that is not equal to "A" or "B". This suggests that a lot of firms have different independence indicators now than they did when BHL performed their research. This could either be due to errors made in the past (or now for that matter) or this could be an indication that many large European firms, now have a large stake (more than 50%) in smaller companies. Third, a lot of firms are dropping out as a result of not having their domicile in one of the fifteen EU member states (measured in 2003). A possible explanation for the decreasing sample size may be that companies have been moving their legal home to a different (European) country. Fourth, Bureau van Dijk mentions that Amadeus holds on to 8-years of financial information, while they used to provide 10-years of worth of financial information. When downloading the data, it seems that 10-years' worth of data is in fact downloaded. This dichotomy might also have something to do with the issue at hand. These are of course only theories and it goes beyond the scope of this thesis to determine what the exact causations of these differences are. This limitation however may have important implications for the comparability of this thesis to the original research of BHL.

Important to note is that the firm-years decrease in order to calculate certain proxies. This is because in order to calculate AEM_4, the change in accruals must first be computed. Calculating the change in accruals requires an additional firm-year to be dropped from the analysis. In order

to not lose these additional firm-years for proxies that do not have this requirement, this is only done for AEM_4. Naturally, this means that the same goes for AEM_{aggr} as AEM_4 is required to calculate this aggregated score. For these measurements the sample drops from 134,180 firm-years to 102,913 firm-years. Although the total firm-years drop, the country-industry-groups remain the same (n= 189). The calculation of REM_2 requires the change in lagged sales, this means that also here an additional firm-year needs to be dropped. Since REM_{aggr} is computed using REM_2, this is also the case for the aggregated measure. The sample drops from 134,180 firm-years to 103,838 firm-years. Again, the country-industry-groups remain stable at 189. Note that AEM_4 and REM_2 are both calculated from the base sample as a starting point, as to minimize the amount of observations lost.

Table 2 displays the descriptive statistics for eight earnings management proxies. These are: AEM_1 to AEM_4, which are the accrual based earnings management measures; REM_1 and REM_2, which are the real earnings management measures; and AEM_{aggr} and REM_{aggr}, which are aggregated measures of both the AEM and REM measures. Presenting as many as 189 descriptive statistics per country-industry-groups is not possible in any methodical manner. That's why mean values are shown on a per country and listing basis. This means the table displays 26 total observations (13 countries * 2 firm types). However, Denmark doesn't have any country-industry-groups that have more than 10 firm-year observations and Portugal doesn't have any public country-industry-groups, effectively displaying 23 total observations. Generally private firms appear to have higher means and medians for all earnings management proxies, except for EM_2. Focusing on AEM_2, it appears very much to depend on the country whether private or public firms report higher means and medians. The mean for AEM_2 is the only mean that is higher for public firms than it is for private firms. However, the median of AEM_2 is still higher for private firms. Only one country, Austria, appears to have higher AEM and REM scores (except for AEM_4) for public firms than for private firms. For all other countries for most measures, the opposite is true.

In table 3 the descriptive statistics for six control variables are visible. These are control variables for which prior work has suggested that there is an association with the level of earnings management or accruals. BHL also use these control variables. They include: SIZE, LEVERAGE, GROWTH, ROA, CYCLE and AGE. Additionally, BHL use two more control variables, which aren't implemented in this thesis. They are: audit quality and ownership concentration. Amadeus doesn't keep track of what auditor a firm had in a specific year. The database only reports what

TABLE 2

Descriptive Statistics for the Earnings Management Proxies by Country and Listing Status

#	Country	Listing Status	Firm-Years	Industry Obs.	AEM1	AEM2	AEM3	AEM4[1]	AEMaggr[1]	REM1	REM2[2]	REMaggr[2]
1	Austria	Private	1111	7	3.469	0.424	-0.480	0.835	63.0	-0.01059	-0.00604	32.6
		Public	32	1	3.500	0.741	-0.437	0.809	69.6	0.02947	0.03696	95.7
2	Belgium	Private	2638	10	2.315	0.510	-0.370	0.833	75.0	-0.01454	-0.00472	34.8
		Public	198	3	0.850	0.502	-0.360	0.819	62.0	0.01176	0.00615	65.2
3	Denmark	Private	0	0	0.000	0.000	0.000	0.000	0.0	0.00000	0.00000	0.0
		Public	0	0	0.000	0.000	0.000	0.000	0.0	0.00000	0.00000	0.0
4	Finland	Private	2406	10	2.321	0.432	-0.401	0.754	62.0	-0.01725	-0.00588	28.3
		Public	421	5	1.115	0.460	-0.418	0.760	53.3	-0.00872	0.00976	63.0
5	France	Private	14767	11	4.717	0.285	-0.414	0.874	69.6	0.01673	0.00984	78.3
		Public	998	6	2.267	0.554	-0.429	0.756	60.9	0.03450	0.02227	97.8
6	Germany	Private	12346	12	3.754	0.372	-0.431	0.847	62.0	-0.02793	-0.02002	21.7
		Public	1166	10	1.354	0.392	-0.409	0.797	43.5	-0.00154	-0.00533	41.3
7	Greece	Private	3584	11	2.252	0.458	-0.443	0.856	63.0	0.01447	0.00087	65.2
		Public	697	10	1.250	0.817	-0.570	0.797	46.7	0.03360	0.01813	93.5
8	Italy	Private	34565	12	4.684	0.421	-0.437	0.896	77.2	0.01831	0.01226	82.6
		Public	443	8	1.410	0.412	-0.550	0.833	44.6	0.00933	0.00063	56.5
9	The Netherlands	Private	715	6	2.676	0.237	-0.545	0.774	33.7	-0.00715	-0.02372	30.4
		Public	221	5	1.056	0.296	-0.642	0.711	14.1	-0.01209	-0.02618	23.9
10	Portugal	Private	5316	11	7.076	0.402	-0.503	0.874	66.3	0.02257	0.01589	87.0
		Public	0	0	0.000	0.000	0.000	0.000	0.0	0.00000	0.00000	0.0
11	Spain	Private	20089	12	3.862	0.410	-0.426	0.874	76.1	0.01536	0.00376	69.6
		Public	344	6	0.750	0.400	-0.350	0.856	57.6	0.01329	-0.00118	56.5
12	Sweden	Private	985	7	1.804	4.050	-0.514	0.731	34.8	-0.03527	-0.03178	10.9
		Public	355	3	0.469	2.660	-0.542	0.679	12.0	-0.03149	-0.04375	8.7
13	United Kingdom	Private	26775	12	2.118	0.344	-0.496	0.800	40.2	-0.00103	-0.00069	50.0
		Public	4008	11	1.006	0.340	-0.627	0.673	13.0	-0.03590	-0.03719	6.5

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TABLE 2 (continued)
Descriptive Statistics for the Earnings Management Proxies by Country and Listing Status

#	Country	Listing Status	Firm-Years	Industry Obs.	AEM1	AEM2	AEM3	AEM4[1]	AEMaggr[1]	REM1	REM2[2]	REMaggr[2]
	Mean		125297	121	3.808	0.383	-0.447	0.856	65.0	0.00683	0.00316	63.5
	(Total)		8883	68	1.213 ***	0.420 ***	-0.537 ***	0.726 ***	31.9 ***	-0.00969 ***	-0.01496 ***	37.8 ***
	Median				3.862	0.410	-0.437	0.874	69.6	0.01536	0.00376	69.6
					1.006 ***	0.339 ***	-0.566 ***	0.711 ***	14.1 ***	-0.01209 ***	-0.02618 ***	23.9 ***
	Standard Deviation				1.254	0.052	0.034	0.040	14.5	0.01557	0.01034	21.0
					0.449	0.140	0.101	0.059	19.9	0.02783	0.02409	34.9

[1] In calculating the proxies AEM4 and AEMaggr the sample is smaller than the base sample (size stated below). This is due to the fact that AEM4 is calculated using the change in accruals. In order to calculate the change in accruals an additional year must be dropped from the sample. This leaves a total sample of 102,913 firm-years, consisting of 95,562 private firm-years and 7,351 public firm-years. The same holds true for AEMaggr, since AEM4 is needed to calculate AEMaggr.

[2] In calculating the proxies REM2 and REMaggr the sample is also smaller than the base sample. However, for these proxies the change in lagged sales is required. This means that here also a firm year must be dropped from the sample. To be clear, the firm-years that are dropped for the proxies AEM4 and AEMaggr are not dropped for the calculation of these proxies. This means that different firm-years are dropped in the calculation of these proxies. This leaves a total sample of 103,838 firm-years, with 96,391 being private firm-years and 7,447 being public firm-years. REM2 is needed in the calculation of REMaggr, so REMaggr has the same firm-years.

*** Indicates statistical significance at the 1 percent level (two-tailed). The differences between sample means and medians is evaluated using t-tests and respecitively Wilcoxon rank sum tests.

The base sample consists of 134,180 firm-years from non-financial companies over the years 2006-2015. The sample contains public and private firms from 13 countries that were members of the European Union in 2003. Luxembourg and Ireland were also member states in 2003, however in the original paper of Burgstahler et al. (2006) they were omitted due to missing data. In order to enhance the comparability between this thesis and their paper, the same approach is followed. Denmark and Portugal's public firms have zero firm-year observations, however they are still included in the table to provide a better outline. All data is taken from the database "Amadeus", which is supplied by Bureau van Dijk. Analyses are performed on country-industry-groups, according to the classification in Campbell (1996), which means that firms are grouped together when they share the same country, listing status and industry. If a group has less than ten firm-year observations, this group is deleted from the sample. All accounting items that are required in order to calculate the proxies are winsorized at the 1st and 99th percentile as to decrease the potential influence of outliers. This table displays mean values of the eight earnings management proxies by country and listing status in concordance with Leuz et al. (2003). This is done to give some indication of the mean value per proxy per country and listing status. There are to many country-industry groups to provide an orderly overview per country-industry-group.

AEM1 is the number of small profits divided by the number of small losses. A firm-year observation is classified as a small profit or a small loss if the positive or negative net income falls within the range of 1% of lagged total assets. AEM2 is the median ratio of the absolute value of total accruals to the absolute value of cash flow from operations. Total accruals are calculated following Dechow et al. (1995), which is: (Δ total current assets – Δ cash) – (Δ total current liabilities – Δ short term debt) – depreciation expense). Cash flow from operations is equal to operating income minus total accruals. AEM3 is the ratio of the standard deviations of operating income and cash flow from operations. AEM4 is the Spearman correlation between the change in total accruals and the change in cash flow from operations. AEMaggr (the aggregated earnings management measure) is the average percentage rank across AEM1 to AEM4. Higher AEM values correspond with more earnings management. REM1 is computed as the abnormal level of cash flows from operations. REM2 is computed as the abnormal production costs. As with EMaggr, REMaggr is calculated as the average percentage rank across REM1 and REM2. Lastly, all differences between public and private firms' sample means and medians are analyzed per proxy using t-tests for means and Wilcoxon rank sum tests for medians.

TABLE 3

Descriptive Statistics for the Control Variables by Country and Listing Status

#	Country	Listing Status	Industry Obs.	SIZE	LEVERAGE	GROWTH	ROA	CYCLE	AGE
1	Austria	Private	7	28100	6.1%	3.0%	3.4%	72.9	34
		Public	1	268000	9.9%	5.7%	3.4%	90.2	25
2	Belgium	Private	10	27200	12.5%	3.3%	2.5%	100.1	226
		Public	3	367000	16.3%	-1.9%	1.5%	96.1	43
3	Denmark	Private	0	0	0.0%	0.0%	0.0%	0.0	0
		Public	0	0	0.0%	0.0%	0.0%	0.0	0
4	Finland	Private	10	12300	17.4%	2.9%	3.7%	73.1	25
		Public	5	125000	10.2%	2.9%	3.3%	76.4	24
5	France	Private	11	7558	6.3%	2.6%	3.6%	93.2	28
		Public	6	52600	10.2%	3.5%	2.0%	127.1	24
6	Germany	Private	12	19300	24.8%	3.8%	4.2%	62.0	26
		Public	10	129000	25.1%	2.6%	3.4%	87.3	22
7	Greece	Private	11	20100	9.3%	0.5%	1.2%	189.2	29
		Public	10	78100	18.0%	-5.2%	-0.8%	222.2	36
8	Italy	Private	12	18300	15.0%	2.2%	1.1%	164.3	31
		Public	8	152000	19.9%	1.4%	2.1%	168.7	26
9	The Netherlands	Private	6	76800	22.6%	2.0%	3.0%	95.4	23
		Public	5	134000	21.1%	-2.1%	3.3%	112.9	33
10	Portugal	Private	11	11200	14.2%	1.7%	1.6%	169.8	31
		Public	0	0	0.0%	0.0%	0.0%	0.0	0
11	Spain	Private	12	15600	11.1%	1.8%	2.2%	129.1	28
		Public	6	365000	21.3%	2.8%	2.0%	172.5	43
12	Sweden	Private	7	149000	7.5%	3.8%	3.3%	61.8	21
		Public	3	632000	12.7%	0.0%	4.3%	93.3	18
13	United Kingdom	Private	12	11300	8.0%	4.7%	4.1%	71.1	21
		Public	11	159000	18.0%	3.5%	4.3%	84.0	20

(continued on next page)

TABLE 3 (continued)
Desciptive Statistics for the Control Variables by Country and Listing Status

#	Country	Listing Status	Industry Obs.	SIZE	LEVERAGE	GROWTH	ROA	CYCLE	AGE
	Mean	Private	121	16500	12.6%	2.9%	2.7%	116.1	27.2
	(Total)	Public	68	166000 ***	18.0% ***	2.2% ***	3.2% ***	108.8 ***	24.1 ***
	Median	Private		15600	11.1%	2.2%	2.2%	129.1	28.0
		Public		159000 ***	18.0% ***	3.5% ***	3.4% ***	87.3 ***	22.0 ***
	Standard Deviation	Private		13500	5.2%	1.2%	1.3%	42.5	3.8
		Public		116000	4.0%	2.6%	1.5%	42.2	6.7

*** Indicates statistical significance at the 1 percent level (two-tailed). The differences between sample means and medians is evaluated using t-tests and respecitively Wilcoxon rank sum tests.

The base sample consists of 134,180 firm-years from non-financial companies over the years 2006-2015. The sample contains public and private firms from 13 countries that were members of the European Union in 2003. Luxembourg and Ireland were also member states in 2003, however in the original paper of Burgstahler et al. (2006) they were omitted due to missing data. In order to enhance the comparability between this thesis and their paper, the same approach is followed. Denmark's public and private firms & Portugal's public firms have zero firm-year observations, however they are still included in the table to provide a better comparable overview. All data is taken from the database "Amadeus", which is supplied by Bureau van Dijk. Analyses are performed on country-industry-groups, according to the industry classifications in Campbell (1996). Creating country-industry-groups means that firms are grouped together when they share the same country, listing status and industry. If a group has less than ten firm-year observations, this group is deleted from the sample. All accounting items that are required in order to calculate the proxies are winsorized at the 1st and 99th percentile as to decrease the potential influence of outliers. This table displays mean values of the earnings management proxies by country and listing status in accordance with Leuz et al. (2003). This is done to give some indication of the mean value per proxy per country and listing status. There are to many country-industry groups to provide an orderly overview per country-industry-group.

The table shows medians for the control variables by country and listing status. SIZE is the book value of total assets at the end of the fiscal year in thousands of EUR. LEVERAGE represents financial leverage and is measured as the ratio of non-current liabilities to total assets. GROWTH is computed as the annual percentage change in revenue. ROA is the yearly return on assets, calculated as net income divided by lagged total assets. CYCLE stands for the operating cycle in days computed as: (yearly average accounts receivable / (total revenue / 360) + (yearly average inventory) / cost of goods sold / 360). Cost of goods sold needs to be calculated separately and is equal to total revenue minus operating income. AGE is an indication of how many years a firm exists. Lastly, all differences between public and private firms' sample means and medians are analyzed per control variable using t-tests for means and Wilcoxon rank sum tests for medians.

auditor a firm currently has. Therefore, including this control variable will inevitably result in firm-year observations where the wrong auditor is appointed. The same story applies to the control variable ownership concentration. The control variables are applied for the AEM proxies as well as the REM proxies.

SIZE is the book value of total assets at the end of the fiscal year in thousands of EUR. LEVERAGE represents financial leverage and is measured as the ratio of non-current liabilities to total assets. GROWTH is computed as the annual percentage change in revenue. ROA is the yearly return on assets, calculated as net income divided by lagged total assets. CYCLE stands for the operating cycle in days computed as: (yearly average accounts receivable / (total revenue / 360) + (yearly average inventory) / cost of goods sold / 360). Cost of goods sold needs to be calculated separately and is equal to total revenue minus operating income. AGE is an indication of how many years a firm exists. All displayed values are median values per country-group.

As is to be expected, table 3 indicates that public firms on average are much larger in size, have greater leverage and are more profitable over time. Interestingly though, it appears that private firms have a longer operating cycle and have existed longer on average. The mean value for firm growth is higher for private firms than it is for public firms, however the median is higher for public firms. This difference most likely arises due to negative firm growth only being reported by public firms and not by private firms.

5. Empirical results and data analysis

5.1 Correlation coefficients

The analysis begins by studying the correlations amongst the different earnings management measures. Table 4 shows the Pearson and Spearman correlations between all earnings management proxies and the independent variable (Public). There are three separate matrices. All coefficients displayed below a 1 are Pearson correlations and all coefficients above a 1 are Spearman correlations. Put another way, all coefficients below the imaginative diagonal line running true all the 1's are Pearson correlations and all coefficients above this imaginative diagonal line are Spearman correlations. The matrices differ in the sense that different sample sizes have to be used in order to calculate different proxies. The total firm-years amongst the three panels differ, but the amount of country-industry-groups remain the same.

The first matrix shows the correlation coefficients between all the variables that are used in the regressions on the base sample. These variables are: AEM_1, AEM_2, AEM_3, REM_1 and Public. All correlation coefficients are significantly correlated at the 1 percent level. AEM_1 has the strongest correlation with Public (Pearson $\rho = 0.24$ and Spearman $\rho = 0.43$) and the strongest correlation in the table occurs between AEM_1 and REM_1 (Pearson $\rho = 0.27$ and Spearman $\rho = 0.33$). The second matrix shows the correlation coefficients of the sample used for the regressions on AEM_4 and AEM_{aggr}. The correlation coefficients of the variables of the first panel are also included, purely for informational purposes. Again all coefficients are significant at the 1 percent level. AEM_4 and AEM_{aggr} show a very strong correlation of Pearson $\rho = 0.79$ and Spearman $\rho = 0.81$ amongst each other. AEM_4 also has a strong correlation with Public (Pearson $\rho = -0.51$ and Spearman $\rho = -0.33$). AEM_{aggr} shows a correlation of Pearson $\rho = -0.37$ and Spearman $\rho = -0.30$ with Public. The last panel, panel three, reports the correlation coefficients of the variables REM_2 and REM_{aggr}. Once more, the other variables are provided purely for informational purposes. All coefficients are significant at the 1 percent level. REM_2 and REM_{aggr} have a very high correlation of (Pearson $\rho = 0.88$ and Spearman $\rho = 0.90$) between each other. Focusing on the correlations with Public, the variable REM_2 has a Pearson correlation of $\rho = -0.27$ and a Spearman correlation of $\rho = -0.17$ and REM_{aggr} has a Pearson correlation of $\rho = -0.22$ and a Spearman correlation of $\rho = -0.17$. The correlation coefficients don't seem to deviate substantially from those of BHL. This of course can only be said of the AEM measures, since they didn't analyze any REM measures.

TABLE 4
Accrual-based Earnings Management and Real Earnings Management Correlation Matrices

Panel A: Pearson and Spearman Correlation Matrix Base Sample

Variables (n=189)	AEM1	AEM2	AEM3	REM1	Public
AEM1	1	-0.070 ***	0.222 ***	0.432 ***	-0.333 ***
AEM2	-0.099 ***	1	0.087 ***	-0.036 ***	0.022 ***
AEM3	0.085 ***	0.048 ***	1	0.168 ***	-0.133 ***
REM1	0.266 ***	0.097 ***	0.178 ***	1	-0.154 ***
Public	-0.235 ***	0.196 ***	-0.145 ***	-0.186 ***	1

Panel B: Pearson and Spearman Correlation Matrix EM4 and EMaggr Sample

Variables (n=189)	AEM1	AEM2	AEM3	AEM4	AEMaggr	REM1	Public
AEM1	1	-0.055 ***	0.217 ***	0.667 ***	0.671 ***	0.441 ***	-0.344 ***
AEM2	-0.095 ***	1	0.095 ***	0.152 ***	0.420 ***	-0.028 ***	0.020 ***
AEM3	0.087 ***	0.056 ***	1	0.268 ***	0.610 ***	0.174 ***	-0.132 ***
AEM4	0.461 ***	-0.068 ***	0.291 ***	1	0.809 ***	0.554 ***	-0.327 ***
AEMaggr	0.492 ***	0.237 ***	0.612 ***	0.787 ***	1	0.460 ***	-0.297 ***
REM1	0.270 ***	0.109 ***	0.184 ***	0.507 ***	0.438 ***	1	-0.158 ***
Public	-0.241 ***	0.199 ***	-0.144 ***	-0.508 ***	-0.363 ***	-0.193 ***	1

Panel C: Pearson and Spearman Correlation Matrix REM2 and REMaggr Sample

Variables (n=189)	AEM1	AEM2	AEM3	REM1	REM2	REMaggr	Public
AEM1	1	-0.056 ***	0.220 ***	0.435 ***	0.358 ***	0.464 ***	-0.345 ***
AEM2	-0.095 ***	1	0.094 ***	-0.024 ***	0.400 ***	0.198 ***	0.206 ***
AEM3	0.008 ***	0.055 ***	1	0.169 ***	0.147 ***	0.150 ***	-0.134 ***
REM1	0.267 ***	0.110 ***	0.179 ***	1	0.677 ***	0.915 ***	-0.158 ***
REM2	0.234 ***	0.333 ***	0.143 ***	0.758 ***	1	0.897 ***	-0.168 ***
REMaggr	0.296 ***	0.215 ***	0.181 ***	0.939 ***	0.876 ***	1	-0.168 ***
Public	-0.241 ***	0.197 ***	-0.146 ***	-0.191 ***	-0.265 ***	-0.220 ***	1

*** Indicates statistical significance at the 1 percent level.

Pearson and Spearman correlations are provided for all accrual-based and real earnings management proxies. A total of three panels are reported, all coefficients displayed below a 1 are Pearson correlations and all coefficients above a 1 are Spearman correlations. Put another way, all coefficients below the imaginative diagonal line running true all the 1's are Pearson correlations and all coefficients above this imaginative diagonal are Spearman correlations. Panel A illustrates the base sample's (134,180 firm-years) correlation coefficients of the earnings management proxies. EM1, EM2, EM3 and REM1 are analyzed in this thesis using this sample. Panel B shows the coefficients of the EM4 and EMaggr sample consisting of 102,913 firm-years. Naturally, EM4 and EMaggr are analyzed in this thesis using this sample. The coefficients of the other proxies are provided purely for information purposes. Panel C displays the coefficients of the REM2 and REMaggr sample containing 103,838 firm-years. Unsurprisingly, REM2 and REMaggr are examined using this sample. Additionally, the supplementary proxies are provided purely for information purposes. Even though the firm-years differ amongst the different panels, the country-industry-groups remain the same (189 country-industry-groups).

Variable Definitions:

AEM1 = ratio of small profits to small losses
AEM2 = magnitude of accruals relative to the magnitude of operating cash flows
AEM3 = smoothness of earnings relative to cash flows
AEM4 = correlation of accounting accruals and operating cash flows
AEMaggr = average percentage rank across AEM1-AEM4
REM1 = abnormal cash flows from operations
REM2 = abnormal production costs
REMaggr = average percentage rank of REM1 and REM2

5.2 Regressions Analyses

This paragraph examines the results that stem from various regression analyses on the eight different earnings management proxies. To reiterate, the hypotheses of this thesis are:

> H1: Public and private firms engage in a different amount of *accrual based* earnings management.
>
> H2: Public and private firms engage in a different amount of *real* earnings management.
>
> These hypotheses contribute to answering the following research question:
>
> RQ: Do firms alter the degree to which they engage in earnings management in the absence of capital market pressure?

Table 5 displays the results of the regressions that examine if public or private firms engage more in earnings management. The table is divided in to two panels. In Panel A OLS-regressions are performed on all accrual-based and real earnings management measures without fixed effects, but with control variables. In Panel B these same regressions are run, however in this model fixed effects are incorporated. These fixed effects include country, industry and year fixed effects. The columns contain the eight different earnings management proxies, while the rows contain the variable of interest (Public) as well as the control variables. The regressions control for firm size, financial leverage, firm growth, return on assets, duration of the operating cycle and the firm's age. All regressions are performed on 189 country-industry-groups.

Panel A is discussed first. Consistent with the expectations of Table 3, a significant negative correlation at the 1 percent level is found between all earnings management proxies and the independent variable Public, except for AEM_2. AEM_2 measures the magnitude of accruals relative to the magnitude of operating cash flows and has a significant *positive* correlation at the 1 percent level with Public. Therefore, it is the only measure indicating that public firms manage their earnings more. AEM_2, has a β_1 of 0.1215. This means that public firms on average have a 0.1215 higher ratio of accruals scaled by operating cash flows, suggesting that public firms

TABLE 5

Accrual-based Earnings Management and Real Earnings Management by Private and Public Firms 2006-2015

Panel A: Earnings Management Proxies without fixed effects

$$AEM_x / REM_x = \alpha + \beta_1 Public + \beta_2 Size + \beta_3 Leverage + \beta_4 Growth + \beta_5 ROA + \beta_6 Cycle + \beta_7 Age + \varepsilon$$

Variables	AEM1	AEM2	AEM3	AEM4	AEMaggr	REM1	REM2	REMaggr
	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)
n	189	189	189	189	189	189	189	189
Intercept	5.3298 ***	0.3235 ***	-0.5716 ***	0.8450 ***	44.0534 ***	0.0326 ***	0.0325 ***	84.4715 ***
	(58.11)	(54.31)	(-118.21)	(374.48)	(75.34)	(40.53)	(43.72)	(103.43)
Public	-2.2429 ***	0.1215 ***	-0.0908 ***	-0.1239 ***	-22.5342 ***	-0.0123 ***	-0.0148 ***	-13.0109 ***
	(-74.85)	(62.41)	(-57.49)	(-175.52)	(-123.21)	(-46.68)	(-63.70)	(-50.80)
Size	-0.0749 ***	0.0038 ***	0.0065 ***	0.0007 ***	0.7330 ***	-0.0014 ***	-0.0016 ***	-1.4723 ***
	(-13.42)	(10.36)	(22.12)	(4.91)	(20.76)	(-28.44)	(-36.01)	(-29.86)
Leverage	-0.1682 ***	0.0005	-0.0046 ***	-0.0055 ***	-1.0965 ***	-0.0074 ***	-0.0028 ***	-4.7564 ***
	(-8.89)	(0.42)	(-4.61)	(-12.66)	(-9.67)	(-44.24)	(-19.01)	(-29.89)
Growth	0.0018	0.0007 ***	0.0007 ***	0.0003 ***	0.0774 ***	0.0001 ***	0.0002 ***	0.1306 ***
	(0.55)	(3.1)	(3.95)	(4.43)	(4.10)	(4.81)	6.58	(4.92)
ROA	-0.8448 ***	-0.1224 ***	-0.0271 ***	-0.0564 ***	-17.1777 ***	-0.0235 ***	-0.0227 ***	-29.7170 ***
	(-12.81)	(-28.57)	(-7.8)	(-30.93)	(-36.37)	(-40.56)	(-37.80)	(-44.96)
Cycle	0.0002 ***	0.0000 *	0.0000 ***	0.0000 ***	0.0016 ***	0.0000 ***	0.0000 ***	0.0033 ***
	(15.42)	(-1.82)	(9.74)	(26.44)	(18.92)	(37.64)	(16.85)	(27.64)
Age	0.0020 ***	-0.0002 ***	-0.0002 ***	0.0001 ***	-0.0029 ***	0.0000 ***	0.0000 ***	-0.0362 ***
	(6.63)	(-9.67)	(-11.59)	(11.78)	(-1.59)	(-13.72)	(-19.98)	(-14.13)
R^2	6.02%	4.58%	2.68%	27.25%	21.33%	7.69%	10.54%	9.15%
Adj R^2	6.01%	4.57%	2.68%	27.24%	21.31%	7.69%	10.54%	9.14%

(continued on next page)

TABLE 5 (continued)
Accrual-based Earnings Management and Real Earnings Management by Private and Public Firms 2006-2015

Panel B: Earnings Management Proxies fixed effects model

$$AEM_x / REM_x = \alpha + \beta_1 Public + \beta_2 Size + \beta_3 Leverage + \beta_4 Growth + \beta_5 ROA + \beta_6 Cycle + \beta_7 Age + \beta_8 Industry\ fixed\ effects + \beta_9 Country\ fixed\ effects + \beta_{10} Year\ fixed\ effects + \varepsilon$$

Variables	AEM1	AEM2	AEM3	AEM4	AEMaggr	REM1	REM2	REMaggr
	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)	Coefficient (T-stat)
n	189	189	189	189	189	189	189	189
Intercept	6.0284 ***	0.4673 ***	-0.2478 ***	0.746 ***	59.2544 ***	-0.0550 ***	-0.0177 ***	21.3442 ***
	(40.89)	(43.29)	(-28.56)	(-251.32)	(86.21)	(-55.18)	(-15.43)	(20.44)
Public	-1.2932 ***	0.1662 ***	-0.0592 ***	-0.088 ***	-11.6701 ***	-0.0061 ***	-0.0096 ***	-5.7412 ***
	-55.69	(97.99)	(-43.31)	(-193.13)	(-110.72)	(-38.75)	(-54.59)	(-35.95)
Size	-0.0288 ***	-0.0030 ***	0.0031 ***	0.000 **	0.0485 **	0.0000	-0.0005 ***	-0.2275 ***
	(-6.54)	(-9.35)	(11.86)	(2.20)	(2.35)	(-0.71)	(-15.45)	(-7.29)
Leverage	-0.2229 ***	-0.0117 ***	0.0005 ***	0.000	-0.9549 ***	-0.0013 ***	-0.0009 ***	-1.1614 ***
	(-15.43)	(-11.06)	(-3.36)	(-0.77)	(-14.90)	(-13.59)	(-8.44)	(-11.93)
Growth	0.0000	0.0005 ***	-0.1739 ***	0.000 ***	0.0390 ***	0.0001 ***	0.0001 ***	0.0944 ***
	(0.01)	(2.97)	(3.26)	(4.08)	(3.71)	(6.71)	(6.70)	(5.91)
ROA	-0.0247	-0.0693 ***	-0.0174 ***	-0.003 ***	-4.0139 ***	-0.0060 ***	-0.0081 ***	-8.1524 ***
	(-0.49)	(-18.94)	(-5.91)	(-2.87)	(-15.09)	(-17.74)	(-18.19)	(-20.23)
Cycle	0.0000	0.0000	0.0000 *	0.0000 ***	0.0001 **	0.0000 **	0.0000 *	0.0001
	(-0.18)	(0.88)	(1.86)	(3.29)	(2.34)	(2.00)	(1.86)	(1.40)
Age	-0.0009 ***	-0.0001 ***	-0.0002 ***	0.0000 ***	-0.0149 ***	0.0000 ***	0.0000 ***	-0.0124 ***
	(-4.21)	(-8.04)	(-18.09)	(6.41)	(-14.23)	(-8.88)	(-10.83)	(-7.87)
R^2	47.16%	31.83%	31.85%	71.81%	73.74%	69.32%	52.72%	67.12%
Adj R^2	47.14%	31.81%	31.83%	71.80%	73.73%	69.31%	52.70%	67.11%

(continued on next page)

TABLE 5 (continued)

***, ** and * Indicate statistical significance at the 1 percent, 5 percent and 10 percent levels (two-tailed), respectively.

Panel A shows the results of multiple regressions analyses performed on 189 country-industry-groups from 13 European countries for the years 2006-2015. These regressions all have an earnings management proxy as dependent variable. The meaning of the proxies is described in Table 2. All regressions include all control variables, but no fixed effects. All earnings management scores are established in such a manner that higher scores indicate higher levels of earnings management. Most control variables display a relatively low value for the various proxies (excluding the aggregated proxies), this is because the control variables are relatively large numbers in comparison to the earnings management proxies. This is especially true for CYCLE and perhaps also AGE. As a result the coefficients are relatively small. *Public* is dummy variable taking a value of 1 if a firm is publicly traded and 0 otherwise. *Size* is the book value of total assets at the end of the fiscal year in thousands of EUR. The log value of size has been used for the regressions, because similar variables are scaled. *Leverage* represents financial leverage and is measured as the ratio of non-current liabilities to total assets. *Growth* is computed as the annual percentage change in revenue. *ROA* is the yearly return on assets, calculated as net income divided by lagged total assets. *Cycle* stands for the operating cycle in days computed as: (yearly average accounts receivable / (total revenue / 360) + (yearly average inventory) / cost of goods sold / 360). Cost of goods sold needs to be calculated separately and is equal to total revenue minus operating income. *Age* is an indication of how many years a firm exists. The table displays OLS coefficients as well as their accompanying t-statistics in parentheses.

Panel B is similar to panel A, but differs in that fixed effects are included in the regression analyses. These fixed effects are: industry, country and year fixed effects. The fixed effects are included but not reported. All other factors remain the same and thus this panel also displays OLS coefficients as well as their accompanying t-statistics in parentheses.

engage more in accrual-based earnings management, by manipulating and increasing their accruals. Taking this value as a percentage of the mean value of AEM_2 (the mean is .386 for the entire sample) this is a difference of 31.5% between public and private firms. The most economically significant difference appears to occur at AEM_1, where $\beta_1 = -2.2429$. This is an indication that private firms on average have a higher ratio of small profits to small losses of 2.2429. This is a big difference, since the mean of AEM_1 is 3.636 for the entire sample. Expressed as a percentage of the mean value of AEM_1, this indicates a percentage difference of 61.7% between public and private firms. Thus, private firms appear to report more small profits than small losses by a vast amount compared to public firms. Additionally, AEM_1 is also statistically significant at the 1 percent level.

The most interesting measures to look at are the aggregated earnings management measures, AEM_{aggr} and REM_{aggr}, since they comprise multiple single measures (AEM_1 -AEM_4 and REM_1 REM_2 respectively). AEM_{aggr} and REM_{aggr} indicate that, private firms manage their earnings more than public firms, signifying significant negative correlations at the 1 percent level. AEM_{aggr} has a β_1 of -22.5342. This signifies that private firms on average score a higher ranking of roughly 22.5, when aggregating all scores of AEM_1 to AEM_4 in to a percentage rank. The beta coefficient of REM_{aggr} shows that private firms on average have a higher score of roughly 13.0, when looking at the rank scores of the real earnings management proxies. The rankings enable a score between 0 and 100. This means that rank differences of 22.5 and 13.0 are economically significant. Expressing these average rank differences as a percentage of the mean values of these aggregated measures, results in percentage differences of 35.9% for AEM_{aggr} and 21.1% for REM_{aggr}. Where the means are 62.6 respectively 61.7.

Most control variables are also significant at the 1 percent level for all measures. A few exceptions include: Growth, which is not significant at all in relation to AEM_1; Leverage, which is not significant in combination with AEM_2; and Cycle, which is only significant at the 10 percent level in the analysis of AEM_2. Most control variables display a relatively low value for the various proxies (excluding the aggregated proxies), this is because the control variables are relatively large numbers in comparison to the earnings management proxies. This is especially true for CYCLE and perhaps also AGE. As a result the coefficients are relatively small. The model used in Panel A explains about 21 percent and 9 percent of the variance for the proxies AEM_{aggr} and REM_{aggr}, respectively.

Panel A explains relatively little of the variance compared to Panel B. Panel B includes fixed effects and this helps explain a greater part of the model. When analyzing Panel B, the results do not change. All earnings management proxies still suggest that private firms manage earnings more than public firms, besides AEM_2. Again AEM_2 suggests that public firms engage more in accrual-based earnings management than private firms. The β_1 increases for the fixed effects model. The beta coefficient of Public is 0.1662 for this proxy in the fixed effects model, indicating that public firms have a higher accruals to operating cash flow ratio of 0.1662 on average and thus suggesting that public firms manipulate their earnings more. Expressed as a percentage of the mean value of AEM2, this results in a difference of 43.1%.

Unsurprisingly, AEM_1 is the proxy that has the most economic significance. However, this economic significance does diminish in the fixed effects model. Where β_1 is -2.2429 in Panel A, the value decreases to -1.2932 in Panel B. Thus, the fixed effects model suggests that for the average public firm, the ratio of small profits to small losses is 1.2932 higher compared to the average private firm. This is still a sizeable difference. Focusing on the percentage change based on the mean value of AEM_1 this shows a difference of 35.6% between public and private firms.

The aggregated measures still propose that private firms participate more in earnings management, as both AEM_{aggr} and REM_{aggr} are still significant at the 1 percent level. However, once again, the economic significance appears to be diminished for the fixed effects models. AEM_{aggr} has a β_1 of roughly -11.7. This implies that private firms on average score a higher ranking of 11.7, when aggregating all individual scores of AEM to AEM_4. The beta coefficient of REM_{aggr} indicates that private firms on average have a higher score of roughly 5.7. Taking these values as percentages of their means, this results in differences of 18,6% for AEM_{aggr} and 9.2% for REM_{aggr}.

More control variables lose their statistical significance in this model, most notably Cycle, which is only statistically significant at the 1 percent level in combination with AEM_4. Furthermore, AEM_1 is the proxy that loses its significance level with the most amount of proxies. Growth, ROA and Cycle are no longer significant in the regressions of AEM_1. The model used in Panel B explains about 74 percent of the variation for AEM_{aggr} and about 67 percent of the variation for REM_{aggr}. For the same reasons as with Panel A, the control variables display very low beta coefficients.

6. Conclusion and limitations

Prior literature has shown mixed results on whether public or private firms report higher earnings quality and/or engage in more earnings management. The aim of this thesis is to provide an answer as to whether capital market pressure leads firms to engage in less or more earnings management and hence aims to contribute to the discussion.

A total of 138,100 firm-years are analyzed. These firm-years are used to create 189 country-industry-groups, on which several OLS-regressions are performed. Eight different earnings management measures are used in order to determine what type of firm is more likely to engage in earnings management. Five of which are accrual-based measures and three of which are real earnings management measures. Of these eight measures, two are aggregated measures of the other AEM and REM measures. Only one measure indicates that public firms manage their earnings more than private firms, this proxy (AEM_2) measures the magnitude of accruals relative to the magnitude of operating cash flows. All other earnings management proxies indicate that private firms engage more in earnings management, this is including the aggregated measures.

Thus, consistent with the results of BHL, the analyses suggest that private firms engage more in earnings management than their public counterparts. This seems to be the case concerning accrual-based earnings management as well as real earnings management. It therefore also appears to be the case that the demand hypothesis holds true. Capital market pressure seems to incentivize firms to report high quality earnings and engage in less earnings management rather than that it incentivizes firms to engage in opportunistic behavior. The finding that private firms appear to engage more in REM, next to AEM seems counterintuitive. One possible explanation for this finding is that private firms are following the examples of public firms and are switching to REM, because it is harder to detect. Further research is needed in order to determine what triggers this phenomenon.

In this research a total of 13 countries are analyzed. All these countries were members of the EU by 2003, these are the same countries BHL analyzed. This is done to have comparable results. Besides using the same countries, the same database (Amadeus) is used.
There are several limitations to this research. As mentioned earlier the sample size is much smaller than the sample that BHL use. At the very least it was expected that the sample size

wouldn't be significantly smaller. It is not clear what the causation of this is, paragraph 4.3 provides some suggestions however. The most plausible reason seems to be that the most recent versions of Amadeus categorize a significant amount of firms as non-independent firms, and are therefore dropped from the sample. This unexplained difference may be affecting the results in some unexplained manner. This would have been a bigger issue if the results were contrary to those of BHL, but the findings are the same.

This research comes with potential endogeneity problems. The distinctions between public and private firms are used as a proxy for capital market pressure, naturally there are more factors at play and thus potentially, there are omitted correlated variables at work. Additionally, earnings management and earnings quality are known to be difficult to measure (e.g. Ball 2013). It may therefore be the case that also here omitted correlated variables are at work, which may affect the results.

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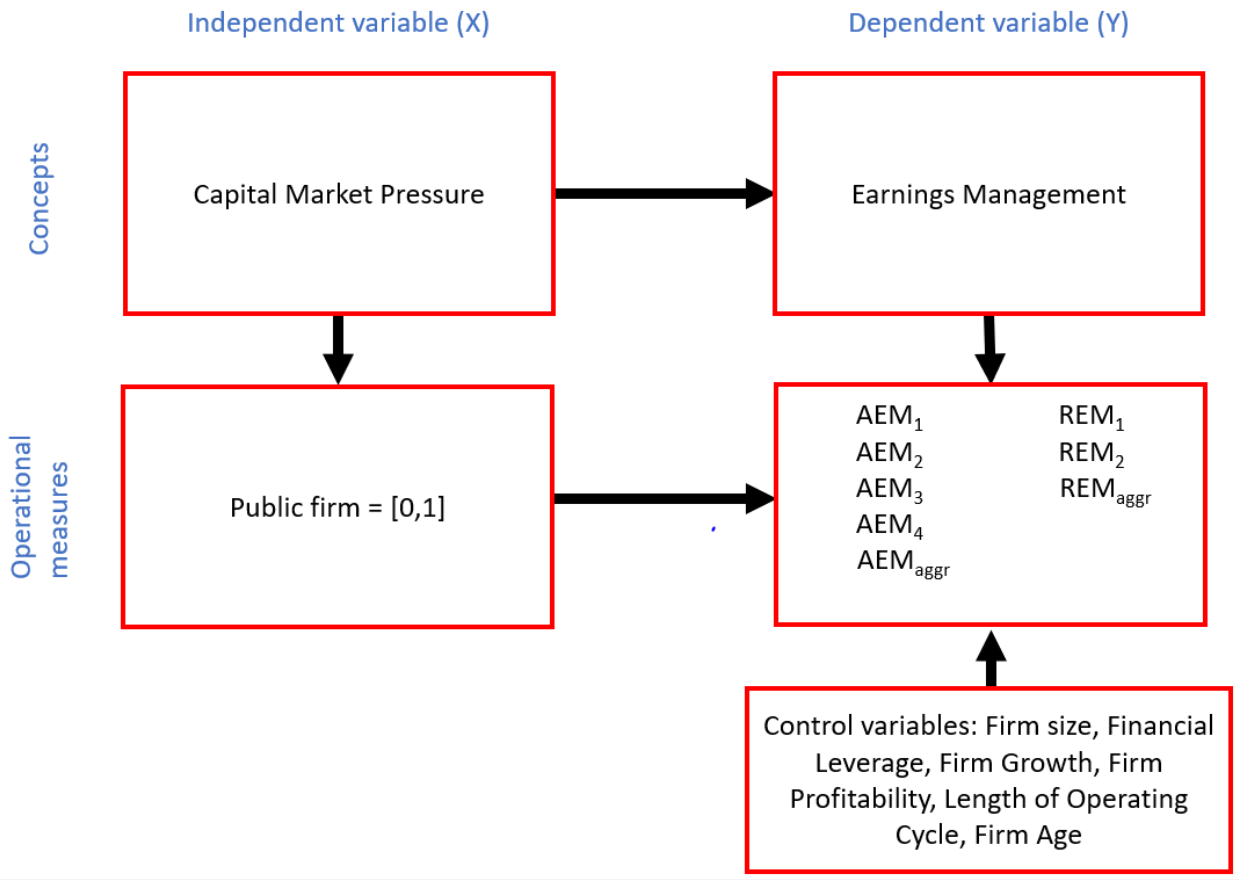
Appendix: Libby Boxes



Meaning of the abbreviations of the dependent variables:

AEM_1:	Tendency of Firms to Avoid Small Losses
AEM_2:	Magnitude of Total Accruals
AEM_3:	Smoothness of Earnings Relative to Cash Flows
AEM_4:	Correlation of Accounting Accruals and Operating Cash Flows
AEM_{aggr}:	Aggregated Index of AEM_1 to AEM_4
$REM_{1:}$	Abnormal cash flows
REM_2:	Abnormal production costs
REM_{aggr}:	Aggreated Index of REM_1 and REM_2