Earnings management in public and private companies in The Netherlands

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Abstract

This paper investigates the use of earnings management in public and private companies within the Netherlands. Because public companies are exposed to various capital market pressures and share prices of public companies are influenced by reported earnings, I expect that public companies engage more in earnings management than private companies. This study combines the power of two models frequently used to measure earnings management: (1) The earnings distribution model; and (2) The modified Jones model. By applying both models on my sample of financial data of 77 public companies and 3.105 private companies between 2000 and 2009, I provide strong evidence of earnings management. The two models show evidence that both public and private companies in the Netherlands engage in earnings management. I'm unable to provide convincing evidence that earnings management is applied more in either public or private companies. The earnings distribution model shows mixed results, although the evidence of earnings management in private companies is stronger. The modified Jones model shows overwhelming evidence of more earnings management in public companies.

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1. Introduction

Accounting numbers are important for evaluating the performance of companies. The investment decision of potential future investors is dependent on the financial performance of a company. In the Annual report of Ahold, one of the first highlighted quotes from the CEO is: *"We made good progress with our strategy for profitable growth, increased sales and operating income and strengthened our competitive position"* (Ahold Annual Report 2008, p.3).

Earnings are a key indicator of the performance of a company. Empirical evidence suggests that there are unusual low frequencies of small earnings decreases and losses, while there are unusual high frequencies of small earnings increases and small profits (Burgstahler & Dichev, 1997). It seems that there are incentives for managers to report earnings increases and positive earnings. Prior research confirms this and suggests that there are a lot of incentives for managers to manage their earnings. Those incentives can roughly be categorized into (1) capital market expectations and valuations; (2) contracts written in terms of accounting numbers; (3) antitrust or other government regulation (Healy & Wahlen, 1999).

Annual reports need to be in accordance with certain accounting rules, those rules leave room for judgements and add value if they enable financial statements to reflect the economic performance/position of a company and ensure that good performing companies can be distinguished from bad performing companies. The accounting regulation permits the manager to make judgements and make certain choices in financial reporting. In theory, the company should select accounting methods and make estimations which best reflects the economical position of the company. In practice this means that managers are able to choose methods and make estimations that do not reflect the true economic position of the company but provide a more positive image (Healy & Wahlen, 1999). There is room for subjectivity and companies can 'manage' their earnings and potentially mislead stakeholders, which is called earnings management.

This study investigates the role that earnings management plays in public and private companies. There are several reasons to assume that earnings management is applied more in public companies than in private companies. An important aspect is the capital market pressure to which public companies are exposed. The share price of public companies is influenced by the reported earnings and reporting earnings that do not meet expectations can lead to a decline of the share price (DeAngelo et al., 1996). Earnings management in relation to share prices is a popular topic in the earnings management literature. However, there are not a lot of researchers who make a distinction between public and private companies. This study uses data from public and private companies within the Netherlands that are operating in different sectors. This study is aimed at the performance evaluation of companies by it's (potential future) stakeholders.

This study addresses the central research question of whether earnings management is applied in both public and private companies in the Netherlands, and whether the evidence of earnings management is stronger for public companies.

This paper contributes to earnings management literature because it helps to assess the power of two frequently used models to detect earnings management: (1) the earnings distribution model and (2) the modified Jones model. Using the two models on the same sample enables me to compare the results and see whether the models provide contradicting or corresponding results. Using these two methods on the same sample has, to my knowledge, never been done before.

The results of this study are also important to broaden our understanding about earnings management. Prior research mainly focuses on earnings management in public companies, and little is known about earnings management practices in private companies. This study uses data from both public and private companies to help assess the influence of capital market pressure on earnings management. It provides information and insights in the magnitude of earnings management in public and private companies.

Moreover, I use recent data in my sample while evidence of earnings management in prior literature is mainly derived from sample periods roughly between 1980-1998. Little is known about earnings management in the period after the year 2000.

I do not use a matched sample of public and private companies, which is used in other prior research. My sample of private companies is larger in order to represent the population better since there are more private companies in the Netherlands.

I use a sample of companies operating in different unregulated sectors and excluded companies which are operating in the financial sector and public administration. Companies operating is those sectors are under heavy regulatory oversight and tight to strict regulations and might therefore have more incentives to manage earnings out of contractual reasons, rather than to manipulate investors. By eliminating influences of specific industry regulations, I provide evidence of earnings management to manipulate (potential future) stakeholders, while some other researchers focused on heavily regulated sectors (Beatty et al. 2002, focussing on banks). It can be important for investors and auditors to realize that private companies might also be inclined to use earnings management just as public companies.

This study is organized as follows. Section 2 explains what earnings management is, discusses prior literature and discusses two models that are used to measure earnings management. Section 3 includes information about my hypothesis, used sample and research methodology. In section 4, I provide the main results of this paper. Finally, section 5 includes a conclusion and discussion of the results.

2. Earnings management

2.1 What is Earnings management

Healy and Wahlen (1999, p.368) provide a definition of earnings management which is commonly used:
"Earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

Earnings consists of two parts, cash flows and accruals. The cash flows are the incoming and outgoing cash flows of the company. Dechow (1994) states that, although the success of a company ultimately depends on it's ability to generate cash, cash from operations is not a good measure for performance because of timing and matching problems (e.g. credit sales). To overcome these problems, the revenue recognition principle and the matching principle are used. Dechow (1994) states that revenues can only be recognized when a company has performed all of the services to be provided and the cash receipt is reasonable certain (recognition) and that cash outflows related to revenues have to be expensed in the period in which the company recognizes the revenue (matching). So, the revenue of a credit sale can be recognized (in the income statement) although the cash is not yet received. The proceeds of that future cash flow are recognized as an asset (in the balance sheet), that is a part of the accruals. The accrual process is hypothesized to mitigate timing and matching problems in the use of cash flows so that earnings more closely reflects the performance of a company.

The accounting rules leave some room open for judgements and estimations made by managers, which brings subjectivity into the financial statements. A few examples are the estimation of the lives and salvage values of assets, losses from bad debt provisions and asset impairments. Another important subjective element is the estimation of pension accruals. Bergstresser et al. (2006) found that companies alter their expected rates of return from pension assets to boost corporate profits. Managers can also manipulate earnings through decision making, an example is making investment decisions. The decision of how much and when to invest in research and development or advertising influences the costs and expenses in a particular period. Another example is to choose which accounting principles are applied, like the depreciation method, inventory valuation methods (e.g. LIFO/FIFO) and work in process valuation (e.g. percentage of completion/completed contract). All these decisions influence the financial position and results of a company.

Judgements, which are by definition subjective, can add value if managers choose accounting methods and make estimations which best reflects the underlying economic performance of the company, thereby making the reports more informative. Earnings management is applied when managers misuse this accounting judgement to mislead stakeholders and potential future investors. However, there is an important distinction between earnings management and earnings manipulation (Vander Bouwhede 2003). Earnings management is legal and applied within the boundaries of the accounting principles and rules, while earnings manipulation can be regarded as fraud.

2.2 Prior research on earnings management

The primary focus of research on the topic of earnings management has been on whether earnings management exist and when it is applied. Another aspect of earnings management which is investigated more frequently in the last couple of years, are the measures of earnings management. Researchers investigated the role that particular accruals played in earnings management like bank loan loss provisions, claim loss reserves for insurers and deferred tax valuation allowances (Healy & Wahlen, 1999).

Healy & Wahlen (1999) state that there are three main types of incentives for earnings management which are investigated in prior research: (1) capital market expectation and valuation; (2) contracts written in terms of accounting numbers; (3) anti-trust or other government regulation.

Burgstahler and Eames (1998) have investigated the role of capital market expectations and found evidence of income increasing earnings management to meet the expectations of financial analysts and management forecasts. Kasznik (1999) found evidence that companies manage accruals to meet market expectations. Bushee (1998) found evidence of research and development cuts to meet the financial analyst expectations.
Evidence of earnings management incentives because of capital market expectations also come from DeAngelo et al. (1996). He found that reporting an earnings decline after a couple of years of consecutive earnings increases leads to a substantial decline of the share price. Chevis et al. (2007) investigated the market reward to companies that consistently meet or exceed analysts' consensus forecasts. Their results show the existence of a positive market response over a longer time horizon. This incremental valuation premium increases with the length of the horizon over which companies meet the forecast targets. Those companies enjoy significantly higher valuations of income and book value of equity than companies that do not meet expectations He found that there is a greater premium (penalty) for meeting /beating (missing) of earnings expectations.

Deangelo (1988) and Perry & Williams (1994) found considerable evidence of earnings management prior to management buyouts, when managers have an incentive to understate earnings or to show high unexpected accruals that are income decreasing. In times prior to equity offers there is also evidence of earnings management used to increase income. There is evidence of companies reporting positive unexpected accruals in times of seasoned equity offers, initial public offers and stock financed acquisitions (Healy & Wahlen, 1999). Another incentive to manage earnings is compensation for executives. Bergstresser & Philippon (2006) state that in the last 15 years there has been an enormous increase in stock based and option based executive compensation. Since stock prices are influenced by reported earnings, managers in public companies might have an incentive to manage earnings for their own wealth and engage in myopic thinking. To fight this, companies often implement long-term performance plans to stimulate the creation of long-term shareholder value instead of a short term orientation. Richardson & Waegelein (2002) show evidence that compensating managers based upon long term performance plans is associated with lower levels of earnings management.

Prior research of Burgstahler & Dichev (1997), Degeorge et al. (1999) and Hayn (1995) shows a pattern that companies tend to report unusual low frequencies of small earnings decreases and losses, while a higher frequency of small earnings increases and profits is reported. The expected frequencies of the levels of reported earnings and the levels of changes in reported earnings is based upon the normal distribution. Researchers found abnormalities and further investigated whether those abnormalities could be attributed to earnings management. They found that particular accruals were managed to increase earnings and to avoid losses. Burgstahler & Dichev (1997) found evidence that the two components of earnings, cash flow from operations and changes in working capital (accruals), are used to increase earnings. In prior literature there is considerable evidence on the existence of earnings management.

Prior research mainly focuses on public companies and capital market influences. One of the first researchers that made a separation between public and private companies in their research on earnings management, was Beatty et al. (2002). She conducted research on small earnings declines/increases and focussed on the private and public banking sector in the United States of America. She found evidence of public banks reporting more small earnings increases than expected and fewer small earnings decreases than expected. Private banks reported only marginally fewer small decreases than expected. She further shows evidence that public banks report significantly less decreases in earnings than private banks. The public banks use discretion in the loan loss provisions and security gains and losses to increase earnings. After Beatty et al. (2002) other researchers focused on the private/public status in relation to earnings management (Van Der Bouwhede et al. 2003, Coppens & Peek 2005, Arnedo et al. 2007).

Private companies are in general smaller than public companies and shares of private companies are often owned by the company management or by shareholders that have a special relationship with the management (Fama & Jensen, 1983). Nagar et al. (2001) found that the ownership of private companies is more concentrated and shares are traded less frequently than shares of public companies. So, there is a longer investment horizon in private companies and shareholders have a lower cost of acquiring information since they are often involved in the day to day operations and are a part of the management (Beatty & Harris, 1999). Shareholders of private companies directly monitor the management and rely on subjective performance measurement rather than relying on simple accounting based earnings measures to determine the management compensation and performance evaluation (Ke et al., 1999). However, although private companies may have less agency problems than public companies, it is unlikely that agency problems and earnings management in private companies are fully absent. There are still incentives to manage earnings related to written contracts with shareholders of the company. Private companies may want to manage earnings to improve loan agreements or to avoid bank intervention and to manage implicit claims to suppliers and employees (Bowen et al, 1995).

An import factor that creates conflicting incentives for earnings management are tax considerations. A company might want to show earnings increases and high profits to satisfy stakeholders but on the other hand might want to reduce earnings in order to pay less taxes. Ball and Shivakumare (2004) state that tax determination is one of the main objectives of annual statements of private companies. According to Coppens & Peek (2005), the alignment between accounting rules and tax rules is important in order to determine the strength and influence of the tax incentive. They found evidence that companies in some countries where tax regulation is strongly influenced by financial accounting, do not avoid reporting small losses. They state that in the Netherlands there is a low alignment between accounting- and tax regulation. Taxes that need to be paid to the tax administration are not directly derived from the financial statements but from a separate tax report. The tax regulation differs from the accounting regulation. Private companies in the Netherlands might therefore have a weaker incentive to manipulate their earnings downwards than companies in highly aligned countries.

Table 1 shows a short summary of the most important and most relevant papers that are mentioned in this chapter, providing information about the writer(s), subject and main conclusions.

Table 1. Short summary of important prior research

	Writer	Subject	Conclusion
1)	Dechow et al. (1995)	Test of different accrual based models to detect earnings management	The modified version of the Jones model is the most powerful to detect earnings management
2)	Burgstahler & Dichev (1997)	Introduction of the earnings distribution model to detect earnings management	Firms manage reported earnings to avoid earnings decreases and losses. Cash flow from operations and working capital are used to increase earnings
3)	Degeorge et al. (1999)	Observe earnings discontinuities in earnings distributions that indicate threshold based earnings management	Earnings management is driven by at least three thresholds: report positive profits; sustain recent performance; meet analysts' expectations
4)	Healy & Wahlen (1999)	Review of academic evidence on earnings management	Earnings management litarature currently provides only limited insights for standard setters. The focus is on the existence- and incentives for earnings management
5)	Beatty et al. (2002)	Earnings management in private and public banks by observing discontinuities in earnings distribution	Public banks report fewer small earnings declines using loan loss provision and security gain realizations; public companies report longer strings of consecutive earnings increases
6)	Vander Bauwhede et al. (2003)	Earnings management in private and public companies in Belgium	Both private and public companies engage in income smoothing and manage earnings to meet targets
7)	Coppens & Peek (2005)	Earnings management in private firms in EU countries and the influence of tax incentives	Private firms avoid reporting small losses, except for some countries where tax regulation strongly influences financial accounting
8)	Arnedo et al. (2007)	Difference in earnings quality between private and public firms in Spain	Private and public firms show no difference in income smoothing- and increasing activities. Private firms do show higher levels of income decreasing activities
9)	Chen et al. (2010)	Frequency and magnitude of earning management	Companies manage earnings to try to meet analysts' forecasts; more firms manage earnings to avoid earnings declines rather than to avoid losses

Table 2 shows the testing methods and samples used by the writers of the papers that are mentioned in table 1.

Table 2. Used methods and samples in prior research

	Writer	Method	Sample
1)	Dechow et al. (1995)	Modified Jones model and other accrual based models	168.771 firm year observations of public companies between 1950-1991
2)	Burgstahler & Dichev (1997)	Earnings distribution model	64.466 firm year observations of public companies between 1976-1994
3)	Degeorge et al. (1999)	Earnings distribution model	Quarterly data on 5.387 companies between 1974-1996
4)	Healy & Wahlen (1999)	-	-
5)	Beatty et al. (2002)	Earnings distribution model	Annual data of 707 public banks and 1160 private banks in the U.S. between 1988-1998
6)	Vander Bauwhede et al. (2003)	Own designed accrual based model	136 firm year observations of private and public companies in Belgium between 1991-1997
7)	Coppens & Peek (2005)	Earnings distribution model	83.124 firm year observations of private and public companies of 8 EU countries between 1993-1999
8)	Arnedo et al. (2007)	Modified Jones model	46.131 firm year observations of private and public companies in Spain between 1996-2002
9)	Chen et al. (2010)	Earnings distribution model	53.327 firm year observations of public companies between 1984-2004

All the above arguments support a view that public companies have more incentives for earnings management than private companies. Research of DeAngelo et al. (1996) and Chevis et al. (2007) shows that public companies have incentives to meet forecast targets because of an incremental valuation premium that increases with the length of the horizon over which companies meet the forecast targets. Burgstahler & Eames (1998), Kaznik (1999) and Bushee (1998) show that public companies have incentives to meet capital market expectations. Burgstahler & Dichev (1997) state that investors rely on simple low coast heuristics in company valuation, while Ke et al. (1999) show that shareholders of private companies directly monitor the management and rely on subjective performance measurement. Managers in public companies might have an incentive to manage earnings in order to influence the share price for their own personal wealth. Bergstresser & Philippon (2006) state that in the last 15 years there has been an enormous increase in stock based and option based executive compensation. Fama & Jensen (1983) show that private companies are in general smaller than public companies and shares of private companies are often owned by the company management or by shareholders that have a special relationship with the management. Nagar et al (2001) found that the ownership of private companies is more concentrated and shares are traded less frequently than shares of public companies.

The evidence in the above stated papers support my view that public companies have more incentives to manipulate earnings than private companies. However, Bowen en at. (1995) state that private companies may want to manage earnings to improve loan agreements or to avoid bank intervention and to manage implicit claims to suppliers and employees. It seems unlikely that earnings management is not conducted at all in private companies. I therefore hypothesize that earnings management is conducted in both public and private companies but that earnings management is applied more in public companies.

2.3 How to measure earnings management?

Earnings distribution model

A relatively new method to detect earnings management analyses the distribution of reported earnings. The model was first introduced by Burgstahler & Dickev (1997) and is thereafter used in many other earnings management research papers (e.g. Degeorge et al. 1999, Beatty et al. 2002, Coppens & Peek 2005, Chen 2010). The model examines the distribution of reported earnings and looks for abnormal continuities at certain thresholds. These studies are based on the assumption that companies have an incentive to report earnings increases and/or profits instead of earnings decreases and/or losses. Burgstahler & Dichev (1997) found evidence of a higher than expected frequency of small earnings increases and found a lower than expected frequency of small earnings decreases.

An advantage of this approach is that researchers do not have to make estimations about unexpected accruals that can bias the results (like in the modified Jones model). A second advantage is that this model captures the effect of earnings management through cash flows which might not be captured by the modified Jones model that only investigates the accruals (Healy & Wahlen, 1999). The earnings distribution model analyses total earnings, thereby capturing both cash flows and accruals. A third advantage is that by using this method, one is able to determine the pervasiveness of earnings management at certain thresholds.

A disadvantage of this approach is that it doesn't provide evidence on how earnings management is applied, rather than that it is applied. It doesn't specify which particular methods are used to manage earnings. Another limitation is that this method is unable to determine the magnitude of earnings management (Healy & Wahlen, 1999). Holland (2004) found that the results are very sensitive to the chosen interval width. Durtschi & Easton (2005), Dechow et al. (2003) and Beaver et al. (2005) mention that a discontinuity around certain thresholds may be driven by other factors than earnings management and caution researchers to be careful interpreting the results. Vander Bouwhede (2003) mentions that analysing earnings distributions requires a large sample.

Modified Jones Model

In research on earnings management the most frequently used model is the modified Jones model, first introduced by Dechow et al. (1995) as a modification of the original Jones model. This model measures the unexpected accruals. At first, the total accruals are calculated as either the difference between net income and cash flow from operations or working capital accruals minus depreciation. The total accruals are then regressed on variables that are proxies for normal accruals (e.g. revenue/receivables) to allow for typical working capital needs and regressed on gross fixed assets to allow for normal depreciation. The proxies are obtained through the use of a so called 'estimation period'. This is a period in which no systemic use of earnings management is predicted. The proxies are obtained from the estimation period sample and thereafter used to estimate normal (or expected) accruals in the sample that needs to be investigated. The unexpected accruals are then calculated as the difference between the total accruals and estimated normal accruals. Unexpected accruals are thus the unexplained component of total accruals (Healy & Wahlen, 1999).

A limitation of the modified Jones model is that the unexpected accruals have to be calculated/estimated. There is a risk of estimation errors and potentially biased results. Another limitation of the modified Jones model is that it only measures the effect of earnings management through the change in accruals, while earnings management can also be applied through manipulation of the cash flow component (Healy & Wahlen, 1999). Young (1999) states that the modified Jones model suffers from systematic measurement error when depreciation is included in the measurement of accruals, resulting into a biased measurement of the unexpected accrual. Peasnell et al. (2000) claims that manipulating working capital components to manage earnings is more opaque than using depreciation manipulation. Depreciation manipulation is directly observable. He therefore uses an adjusted model that focuses only on the working capital components of the accruals without taking depreciation into account. The critique of Kothari et al. (2005) is about the link between a company's performance and the proxies chosen to measure nondiscretionary accruals. They compared traditional discretionary accrual measures (e.g. Jones & modified Jones model) and performance-matched discretionary accruals. Their results suggest that the performance-matched model enhances the reliability of earnings management research. Although they state that a performance based measure is not always the best measure in every setting. Dechow et al. (1995) states that one of the limitations of the modified Jones model is it's inability to detect less pronounced forms of earnings management.

Combining the two models
In this paper I want to combine the power of the two models. By using the earnings distribution model I'm able to detect whether there are discontinuities around the zero threshold without having to make any estimations. Although I'm unable to totally rule out other explanations than earnings management as an explanation for the discontinuity, I still think that using this method on a large sample and over a long time-span add value to the earnings management literature. To support the evidence of earnings management as an explanation for the discontinuity I use the modified Jones model. Using the modified Jones model allows me to calculate the discretionary accruals, that are a proxy for the level of earnings management. It provides information about the magnitude of earnings management that can't be obtained using the first model. It allows me to partially rule out the explanation that the discontinuity in earnings changes simply reflects the true underlying economic performance of the companies. So the main flaw of the distribution method is partially solved using the latter model. Although the two models measure different aspects of earnings management, the combination of both models on the same sample can provide strong evidence about the pervasiveness and magnitude of earnings management. The results of both methods are first analysed independently and thereafter compared to each other. It allows me to compare the results of the models and see whether they provide corresponding or contradicting results. This can be important for future research on the topic of earnings management.

3. Research design

3.1 Hypothesis

This study investigates the use of earnings management in public and private companies in the Netherlands. As mentioned in the prior research section, I expect that earnings management is applied in both public and private companies but the evidence of earnings management will be stronger in public companies. My hypotheses are as follows:

> *Hypothesis 1: Earnings management to avoid reporting losses is applied in both public- and private companies.*
>
> *Hypothesis 2: Earnings management to avoid reporting losses is applied more in public- than in private companies.*
>
> *Hypothesis 3: Earnings management to avoid reporting earnings decreases is applied in both public- and private companies.*
>
> *Hypothesis 4: Earnings management to avoid reporting earnings decreases is applied more in public- than in private companies.*

Hypotheses 1-4 are tested using the earnings distribution method.

> *Hypothesis 5: Earnings management by using discretion over accruals is applied in both public- and private companies.*
>
> *Hypothesis 6: Earnings management by using discretion over accruals is applied more in public- than in private companies.*

Hypotheses 5 is tested using the modified Jones Model.

3.2 Sample

The sample that I used in this research consists of financial data of 77 public- and 3105 private companies between 2000 and 2009. All companies are active within the Netherlands. There's only few research on earnings management practices in private companies since private companies are not required to publish their financial statements. This makes it hard to acquire data in a feasible way and is a major obstacle for research on this topic. However, I was able to obtain financial data of both public and private companies from the Reach database. The companies used in my sample are operating in different sectors within the Netherlands. The period between 2000 and 2009 is a particularly interesting period because of the two financial crises in this period of time. The burst of the Dotcom bubble in 2000 and the world economic crisis of credit starting in 2007 and still present in 2010.

Like Coppens & Peek (2005), I include companies in my sample that can be defined as large companies according to the definitions of the Fourth EU Company Law Directive. The companies included in the sample have at least one company-year observation that meets the following two criteria: (1) total assets are above 17,5 million euro's; (2) sales are above 35 million euro's. The third criteria of the EU company Directive (the number of employees is above 250) is not accounted for since information about the number of employees was largely unavailable or incorrect.

In my sample of private companies I removed companies that are subsidiaries of listed companies. Companies from which more than 50% of the ordinary shares are owned by a listed company are removed to avoid the possibility that the financial decisions are made by the listed parent company and biases the results. This research makes a distinction between private and public companies, so private companies that are owned by listed mother companies are removed from the sample. Possible information on earnings management in the daughter company is already consolidated into the financial statements of the listed mother company. The sample of private companies contains information from both consolidated and unconsolidated financial statements. By including both consolidated and unconsolidated statements I'm able to detect possible earnings management on the holding level and on the individual company level. I assume that stakeholders will use consolidated statements if they are available, when they are not available I assume that stakeholders will use the unconsolidated statements.

The sample does not contain companies that are operating in the financial institution- and public administration sector. Companies in the financial sector (e.g. banks, pension funds) are under strict regulatory oversight and need to maintain financial ratios. Incentives for earnings management may be heavily related to that specific regulatory oversight and contractual arrangements. This study is aimed at the performance evaluation of companies by it's (potential future) stakeholders. I therefore excluded companies which are operating in the financial sector and public administration.

Prior to 2005, the financial statements of public companies in the Netherlands needed to be in accordance with the Dutch Generally Accepted Accounting Principles (GAAP), just like the private companies. From 2005 the Dutch GAAP was replaced by the International Financial Reporting Standards (IFRS). All listed EU companies are required to use IFRS since 2005. The difference in used reporting standards by private and public companies seems not to bias the results since I use a large sample size and other researchers that made a distinction between public and private companies in their research didn't mention this difference in reporting standards at all.

3.3 Methodology

Earnings distribution model

The first step in this research is to examine the distribution of reported earnings levels and changes in reported earnings around the zero threshold. Earnings management is likely to be reflected in the cross sectional distribution of earnings levels and earnings changes. Like Burgstahler & Dichev (1997), Beatty et al. (2002) and Coppens & Peek (2005) this is measured by the return on assets (ROA) and change in return on assets (ΔROA), calculated as follows:

$$ROA_t = INC_t / A_{t-1}$$

ROA_t = return on assets in year t
INC_t = net income in year t
A_{t-1} = total assets in year t-1

The return on assets is measured as the current year net income divided by the total assets at the beginning of the previous year.

$$\Delta ROA_t = \Delta INC_t / A_{t-1}$$

ΔROA_t = change in return on assets between year t and t-1
ΔINC_t = change in net income between year t and t-1
A_{t-1} = total assets in year t-1

The change in ROA is measured as the current years net income less the previous year net income, divided by the total assets at the beginning of the previous year.

I examine the histograms of the return on assets and changes in return on assets around the zero threshold. As Holland (2004) mentions, the choice of the interval width is a critical consideration in the earnings distribution model and results should include a variety of interval widths to illustrate the robustness of findings. Like Coppens & Peek (2005) I use a fixed interval width of 0.005 and provide additional analysis using different interval width's.

To test for discontinuity in the distribution around the zero threshold I use the following τ statistic, which approximately follows a student's *t*-distribution: (Coppens & Peek, 2005)

$$\tau_n = [\Delta P_n - MEAN(\Delta P_i)] / STD(\Delta P_i)$$

ΔP_n = probability density of interval n minus the probability density of its neighbouring interval n−1

MEAN(ΔP_i) and STD(ΔP_i)= mean and standard deviation of all differences between the probability densities of two neighbouring intervals within an area of 10 intervals surrounding interval n and interval n−1

If the intervals around zero are smooth, then the standardized difference will be distributed approximately normal, with a 0 mean and standard deviation of 1 (Healy 2002).

Modified Jones model

To determine the magnitude of earnings management I use the Modified Jones model. The objective of this model is to segregate normal/expected (nondiscretionary) accruals from the managed/unexpected (discretionary) accruals. To measure nondiscretionary accruals, the total accruals are regressed on variables that are proxies for normal accruals. The proxies that are used in the modified Jones model are the change in revenue, the change in receivables and the level of property plant and equipment. The estimation process of the accruals reads as follows: (Dechow, 1995)

Total accruals:
$$TA_t = (\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t) / (A_{t-1})$$

TA_t = total accruals in year t scaled by total assets at t-1
ΔCA_t = change in current assets between year t and t-1
ΔCL_t = change in current liabilities between year t and t-1
$\Delta Cash_t$ = change in cash and cash equivalents between year t and t-1
ΔSTD_t = change in debt included in current liabilities between year t and t-1
Dep_t = depreciation and amortization expense in year t
A_{t-1} = total assets in year t-1

Nondiscretionary accruals:
$$NDA_t = \alpha_1(1/A_{t-1}) + \alpha_2(\Delta REV_t - \Delta REC_t) + \alpha_3(PPE_t)$$

NDA_t = nondiscretionary accruals in year t scaled by total assets at t-1
$\alpha_1, \alpha_2, \alpha_3$ = company specific parameters
A_{t-1} = total assets in year t-1
ΔREV_t = change in net revenue between year t and t-1 scaled by total assets at t-1
ΔREC_t = change in net receivables between year t and year t−1 scaled by total assets at t-1
PPE_t = property plant and equipment in year t scaled by total assets at t-1

The company specific parameters α1, α2, α3 are calculated using the following model.

$$TA_t = a_1(1/A_{t-1}) + a_2(\Delta REV_t) + a_3(PPE_t)$$

TA_t = total accruals in year t scaled by total assets at t-1
a1, a2, a3 = ordinary Least Squares (OLS) estimates of α1, α2, α3
A_{t-1} = total assets at t-1
ΔREV_t = change in net revenue between year t and t–1 scaled by total assets at t-1
PPE_t = property plant and equipment in year t scaled by total assets at t-1

I was unable to obtain a sample of an estimation period in which no systemic earnings management is predicted. The Reach database provides only data ranging from 2000-2010 and I expect that earnings management *is* applied in that period since I'm using that period in my sample. Dechow (1995) states that it is required to have more than 10 year observations per company in order to efficiently estimate the parameters. I used my own sample to obtain the company specific parameters, although I expect that earnings management is applied in that period and not all companies have 10 year observations of the required variables.

The discretionary accruals can then be calculated when the nondiscretionary accruals are subtracted from the total accruals.

Discretionary accruals:
$$DA_t = TA_t - NDA_t$$

DA_t = discretionary accruals in year t scaled by total assets at t-1
TA_t = total accruals in year t scaled by total assets at t-1
NDA_t = nondiscretionary accruals in year t scaled total assets at t-1

The calculated discretionary accruals are a proxy for the level of earnings management that is applied within a company.

4. Results

My data is derived from the Reach database. This database contains financial data of private and public companies in the Netherlands between 2000 and 2009. I selected all the data of the private and public companies if they had at least one company-year observation with (1) total assets above 17,5 million euro's and (2) sales above 35 million euro's in the period 2000-2009. I deleted companies that are active in the financial institution and public administration sector and private companies that are subsidiaries of public companies. I selected the following variables: net income; total assets; net revenue; property plant & equipment; current assets; current liabilities; receivables; cash and cash equivalents; debt included in current liabilities; depreciation and amortization.

From this sample file I created two separate excel files that included the required variables to apply both the Earnings Distribution model and the Modified Jones model.

4.1 Earnings distribution model

4.1.1 Sample

The Excel file used to analyse the earnings distribution consists of the following variables: net income; total assets. I calculated the return on assets and changes in return on assets and deleted data errors. I did not remove any outliers. Table 3 shows the sample characteristics for the earnings distribution model: mean and standard deviation of total assets; -net income scaled by total assets at t-1 (earnings levels) and -net income changes scaled by total assets at t-1 (earnings changes).

Table 3. Sample summary earnings distribution model

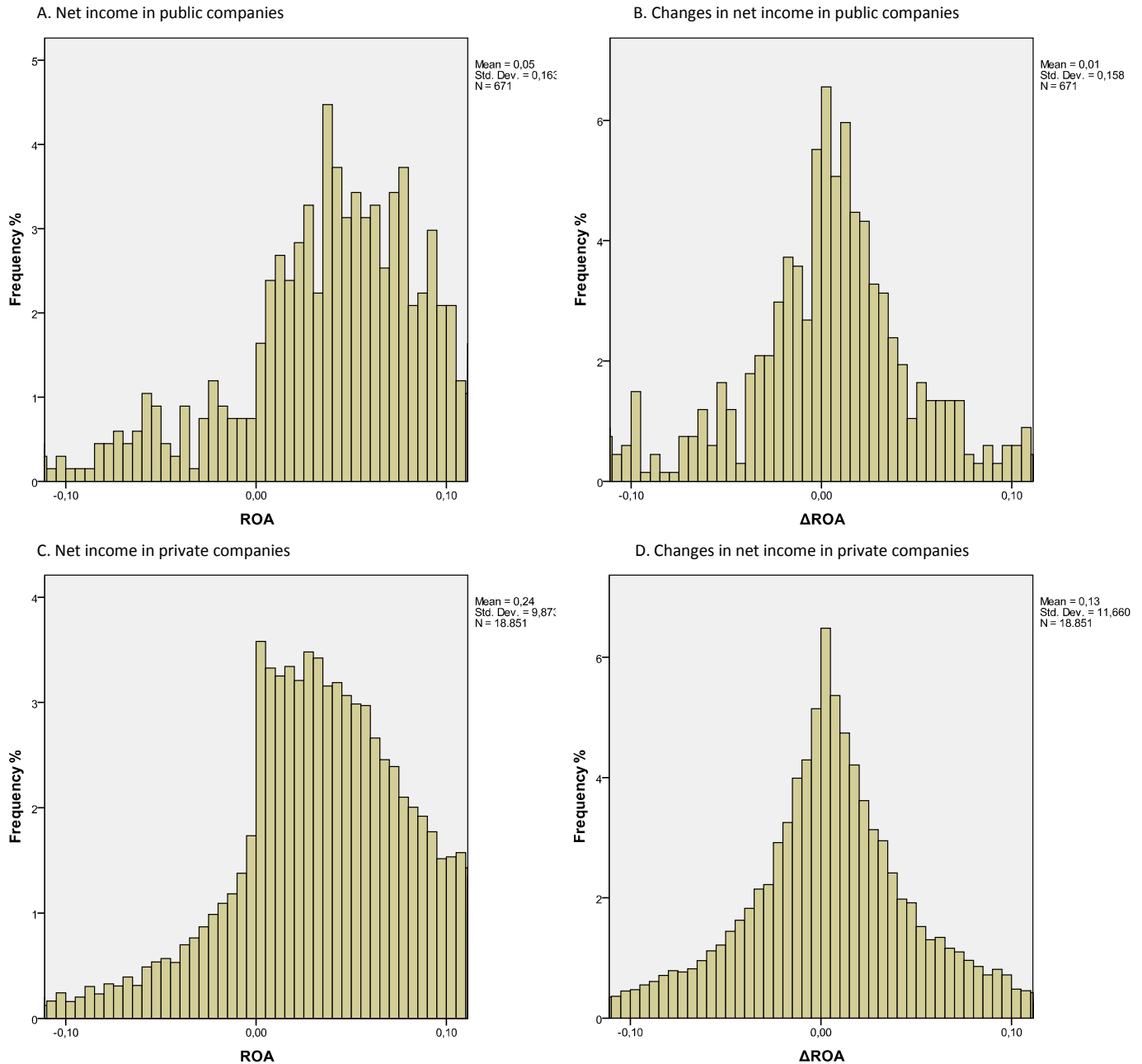| Company Status	N	Total assets		Earnings levels		Earnings changes	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Public	671	3.030.055	7.289.240	0,0515	0,1628	0,0119	0,1584
Private	18.851	160.822	799.338	0,2387	9,8734	0,1257	11,6603

N shows the number of company year observations.
Total assets in thousands of EUR.

The number of observations of private companies is larger than the number of observations of public companies since there are a lot more private companies in the Netherlands. Public companies are considerably larger than private companies regarding the total assets. The table further shows the mean and standard deviations of earnings levels and changes in earnings. The standard deviation of earnings levels and earnings changes in private companies is much larger than in public companies. This is due to the fact that there are a lot of private companies that were founded somewhere between 2000 and 2009 and started to grow. So, there is a higher volatility in asset- and income levels as assets and income grew during the years. Public companies report less volatile assets and income, resulting into smaller standard deviations of earnings and earnings levels.

4.1.2 Analysis of discontinuities

I imported the calculated ROA and ΔROA from excel into SPSS in order to create histograms of the earnings levels and changes in earnings. Figure 1 shows the distribution of the reported income- and changes in reported income scaled by total assets at t-1 around the zero threshold for private and public companies. The chosen interval width is 0.005.

Figure 1

A. Net income in public companies

B. Changes in net income in public companies

C. Net income in private companies

D. Changes in net income in private companies

The chosen interval width is very small in order to be able to detect patterns around the zero threshold and to determine whether the distribution follows a normal distribution.

From the information found in the histograms I calculated the T statistic. The difference in frequency between the probability densities (-0.005,0.00) (= n-1) and (0.00, +0.005) (= n) is compared to the differences between two neighbouring intervals within an area of 10 intervals surrounding (-0.005,0.00) and (0.00, +0.005). I extracted the frequencies (in percentages) of the intervals within an area ranging from -0.05 till +0.05 (=10 intervals) into excel, and calculated the T-statistic. Table 4 shows the T-statistics of the earnings distribution analysis for the interval (0.00, +0.005) for public and private companies.

Table 4. T-statistics with interval width 0.005

Company Status	N	T-statistic	
		Earnings levels	Earnings changes
Public	671	1,1257	1,0286
Private	18.851	11,4055***	2,6056***

N shows the number of company year observations.

*** significantly different from zero at 1% significance level. (t ≥ 2,581)

If the intervals around zero are smooth, then the standardized difference will be distributed approximately normal, with a 0 mean and standard deviation of 1. The t-statistic is significantly different from 0 at a 1% significance level if it exceeds the critical value of 2,581 (t-distribution with 1000 degrees of freedom).

I reject the hypothesis of a smooth distribution of earnings levels and earnings changes for my sample of private companies. This suggests that private companies in the Netherlands manage earnings to avoid reporting small losses and to avoid reporting small earnings decreases. Although the evidence for a discontinuity in earnings levels is stronger than for earnings changes, I am able to accept hypothesis 1 and 3 for my sample of private companies. Hypothesis 1 and 3 state that both public and private companies manage earnings to avoid reporting losses and earnings decreases. Hypothesis 1 and 3 are rejected for my sample of public companies. The results of the public companies show no significance which means that public companies do not manage earnings to avoid reporting losses and earnings declines when an interval width of 0.005 is used. Hypothesis 2 and 4 (earnings management to avoid reporting losses and earnings decreases is applied more in public than in private companies) are also rejected.

As mentioned in sections 2.3 and 3.3, the results of the earnings distribution analysis are very sensitive to the chosen interval width. Therefore I conducted additional research by choosing different interval widths. The results of this additional research are similar for my sample of private companies. Interval widths of 0.001; 0.005; 0.01 al show significant evidence of earnings management in earnings levels and earnings changes for private companies. However, I did also find significant evidence of earnings management in earnings levels and earnings changes in public companies when the interval width of 0.01 is chosen. So when an interval width of 0.01 is applied, both public and private companies show evidence of earnings management and I'm able to accept hypothesis 1 and 3. Public companies also show more evidence of earnings management to avoid reporting earnings decreases than private companies, which allows me to accept hypothesis 4. Hypothesis 2 is rejected in all cases. The results of using an interval width of 0.001 are similar to the results of using an interval width of 0.005. See table 16 in the appendix for the additional analysis.

Table 5 shows an overview of the main conclusions that can be drawn from the earnings distribution analysis when an interval width of 0.005 or 0.001 is applied. It also shows whether the results confirm prior research.

Table 5. Summary results earnings distribution analysis using an interval width of 0.005 or 0.001

Hypothesis	Testresult	Accept/Reject
1) EM to avoid reporting losses is applied in both public- and private companies confirms Burgstahler & Dichev (1997), Degeorge et al. (1999)	EM evidence only found for private companies	Reject
2) EM to avoid reporting losses is applied more in public- than in private companies	EM evidence only found for private companies	Reject
3) EM to avoid reporting earnings decreases is applied in both public- and private companies confirms Burgstahler & Dichev (1997)	EM evidence only found for private companies	Reject
4) EM to avoid reporting earnings decreases is applied more in public- than in private companies	EM evidence only found for private companies	Reject

EM = Earnings management

Table 6 shows an overview of the main conclusions that can be drawn from the earnings distribution analysis when an interval width of 0.01 is applied.

Table 6. Summary results earnings distribution analysis using an interval width of 0.01

Hypothesis	Testresult	Accept/Reject
1) EM to avoid reporting losses is applied in both public- and private companies confirms Burgstahler & Dichev (1997), Degeorge et al. (1999), Coppens & Peek (2005), Chen et al. (2010)	EM evidence found for public and private companies	Accept
2) EM to avoid reporting losses is applied more in public- than in private companies confirms Coppens & Peek (2005)	EM evidence for private companies is stronger	Reject
3) EM to avoid reporting earnings decreases is applied in both public- and private companies confirms Burgstahler & Dichev (1997), Chen et al. (2010)	EM evidence found for public and private companies	Accept
4) EM to avoid reporting earnings decreases is applied more in public- than in private companies confirms Beatty (2002), Coppens & Peek (2005)	EM evidence for public companies is stronger	Accept

EM = Earnings management

From the distribution analysis can be concluded that the evidence of earnings management in private companies is stronger than for public companies.

4.2 Modified Jones model

4.2.1 Sample

To limit the possibility that the discontinuity in the earnings distributions simply reflects the underlying economic performance of the companies I use the modified Jones model. When the modified Jones model confirms that earnings management is applied, it will strengthen my evidence. The excel file used to apply the modified Jones model consists of the following variables: net income; total assets; net revenue; property plant & equipment; current assets; current liabilities; receivables; cash and cash equivalents; debt included in current liabilities; depreciation and amortization.

The variables used in the earnings distribution analysis (net income and total assets) are available for most company year observations in my original dataset. There is a lot of missing data for the other variables that are needed to apply the modified Jones model. The modified Jones model requires the use of a lot more variables than in the earnings distribution analysis. I made calculations in excel to acquire the needed variables to apply the modified Jones model. I did not remove any outliers. The data availability for some variables was scarce (especially debt included in current liabilities and depreciation and amortization), and after making calculations and removing missing values I ended up with a much smaller sample than the sample used in the earnings distribution analysis. Table 7 shows the characteristics of my sample used to apply the modified Jones model, showing the mean and standard deviation of total assets; -net income and -net revenue.

Table 7. Sample summary modified Jones model

Company Status	N	Total assets		Net income		Net revenue	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Public	386	1.804.902	4.539.507	54.232	690.987	1.771.710	3.168.320
Private	5249	147.313	496.267	8.154	66.371	264.064	1.312.917

N shows the number of company year observations.
Total assets, net income and net revenue in thousands of EUR.

The public companies are larger than the private companies regarding total assets, net income and net revenue. The data of this smaller sample is also derived from my original sample of 77 public companies and 3.105 private companies between 2000 and 2009. As mentioned above, my sample for the modified Jones model turned out to be much smaller than the one used in the earnings distribution analysis. However, for the smaller modified Jones sample of 386 public- and 5.249 private companies, information on net income and total assets was available. So I was able to redo the earnings distribution analysis on this smaller sample. The results of using the larger (original earnings distribution) sample and smaller (modified Jones) sample are the same. Although the significance of earnings management evidence in the small sample is somewhat weaker than the significance in the larger sample. I tested the smaller sample using all three interval widths of 0.001; 0.005; 0.01. Table 18 in the appendix shows the results.

4.2.2 Analysis of the discretionary accruals

I calculated the total accruals in excel. Measuring the nondiscretionary accruals required a ordinary least squares analysis in SPSS in order to estimate the company specific parameters. After acquiring the parameters I was able to calculate the nondiscretionary and discretionary accruals in excel. Table 8 shows the calculated mean and standard deviation of the total accruals, -nondiscretionary accruals and -discretionary accruals scaled by total assets at t-1. The table further shows the nondiscretionary and discretionary accruals as a percentage of total accruals.

Table 8. Calculated accruals modified Jones model

Company Status	N	Total accruals		Nondiscretionary accruals		Discretionary accruals	
		Mean	Standard Deviation	Mean	Standard deviation	Mean	Standard deviation
Public	386	-0,0634	0,0956	-0,0191	0,0166	-0,0443	0,0945
Private	5249	-0,0305	0,1659	-0,0193	0,0485	-0,0111	0,1603
Public	386	100%		30%		70%	
Private	5249	100%		63%		37%	

N shows the number of company year observations.

The discretionary accruals as a percentage of total accruals is larger in public companies. The discretionary accruals are 70% of the total accrual for public companies, which means that earnings management is conducted in a very aggressive manner. In private companies, where the discretionary accruals are 37% percent of the total accruals, the total accruals are also heavily influenced by earnings management although less than in public companies.

To test the significance of the discretionary accruals I calculated a one sample t-statistic for both the private and public sample. The test value is 0 since there is no evidence of earnings management when the discretionary accruals are zero. Table 9 and 11 show the sample statistics of the one sample t-test of the discretionary accruals for public and private companies. Table 10 and 12 show the t-statistic of the discretionary accruals for the public- and private companies sample.

Table 9. One-Sample Statistics public companies

	N	Mean	Std. Deviation	Std. Error Mean
DA (discretionary accruals)	386	-,0443	0,0945	0,0048

N shows the number of company year observations.

Table 10. One sample t-test public companies

	Test Value = 0					
					99% Confidence Interval of the Difference	
				Mean		
	t	df	Sig. (2-tailed)	Difference	Lower	Upper
DA (discretionary accruals)	-9,204	385	,000***	-,0443	-,0567	-,0318

*** significantly different from zero at 1% significance level. (t ≥ 2,581)

Table 12. One-Sample Statistics private companies

	N	Mean	Std. Deviation	Std. Error Mean
DA (discretionary accruals)	5249	-,0111	0,1603	0,0022

N shows the number of company year observations.

Table 13. One sample t-test private companies

	Test Value = 0					
				Mean	99% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Difference	Lower	Upper
DA (discretionary accruals)	-5,027	5248	,000***	-,0111	-,0168	-,0054

*** significantly different from zero at 1% significance level. (t ≥ 2,581)

Both samples show significant evidence of earnings management at a 1% significance level. The t-statistic is significantly different from 0 at a 1% significance level if it exceeds the critical value of 2,581 (t-distribution with 1000 degrees of freedom). Both public and private companies engage in earnings management by managing their accruals. Hypothesis 5, stating that both public and private companies manage earnings by using discretion over accruals, can be accepted.

Hypothesis 6, stating that earnings management by using discretion over accruals is applied more in public than in private companies can be investigated using a two-sample t-test. The hypothesis states that discretionary accruals are larger in public than in private companies. The average discretionary accruals scaled by total assets is -0,0443 for public companies compared to -0,0111 for private companies. To test the significance of the difference between the discretionary accruals of public and private companies I calculated a two-sample t-statistic. Table 14 shows the mean and standard deviation of the discretionary accruals of the public and private sample and shows the calculated two sample t-statistic.

Table 14.Two-sample t-statistic

Company status	N	Mean	Standard deviation	T-statistic
public	386	-0,044283	0,09453	
private	5249	-0,011124	0,16031	
difference		-0,033159	-0,06578	-6,261311***

N shows the number of company year observations.
*** significantly different from zero at 1% significance level. (t ≥ 2,581)

Hypothesis 6 can be accepted, the discretionary accruals in public companies are significantly larger than the discretionary accruals of private companies at a 1% significance level. Public companies engage more in earnings management than private companies when the modified Jones model is applied. Table 15 shows the main conclusions that can be drawn from the modified Jones analysis. It also shows whether the results confirm prior research.

Table 15. Summary results modified Jones analysis

Hypothesis	Testresult	Accept/Reject
5) EM by using discretion over accruals is applied in both public- and private companies confirms Vander Bauwhede (2003), Arnedo et al. (2007)	EM evidence found for both public and private companies	Accept
6) EM by using discretion over accruals is applied more in public- than in private companies	EM evidence for public companies is stronger	Accept

EM = Earnings management

5. Discussion and conclusions

This paper combines the power of two frequently used models to detect earnings management within public and private companies in the Netherlands. The sample that I used in this research consists of financial data between 2000 and 2009 from 77 public and 3105 private companies that can be qualified as large according to the criteria of the fourth EU company Directive. Public companies are exposed to various capital market pressures (e.g. market expectations), investors have a short(er) investment horizon, investors base their investment decision mostly on simple low cost heuristics and there is more separation between executives and owners of public companies. Private companies are often smaller, not exposed to capital market pressure, investors/owners are often involved in the management of the company and have a lower cost of acquiring information. I hypothesize that earnings management is applied in both public and private companies. However, I expect that there is more evidence of earnings management in public companies because public companies have more incentives to manage their earnings compared to private companies.

To test the hypotheses I use two existing models; (1) the earnings distribution model and (2) the modified Jones model. The earnings distribution model analyses the reported net income and changes in reported net income around the zero threshold. It looks for abnormalities in the distribution. If the intervals around zero are smooth, then the standardized difference will be distributed approximately normal. I reject the hypothesis of a smooth distribution of earnings levels and earnings changes for my sample of private companies. This suggests that private companies in the Netherlands manage earnings to avoid reporting small losses and small earnings decreases. I did not find such evidence of earnings management in public companies. This suggests that all my hypotheses are rejected since public companies show no evidence of earnings management.
However, the results of earnings distribution model seem very sensitive to the chosen interval width. Using an interval width of 0.005 and 0.001 rejects all my hypotheses, while using an interval width of 0.01 enables me to accept most of my hypotheses. When an interval width of 0.01 is applied, I find evidence of both public and private companies managing their earnings. Both public and private companies manage their earnings to avoid reporting small losses and small earnings decreases. The evidence of avoiding reporting losses is still stronger in private companies but the evidence of avoiding reporting earnings decreases is stronger in public companies. This suggests that I'm able to accept most of my hypotheses.

Not finding evidence of earnings management in public companies when an interval width of 0.005 and 0.001 is used might also be due to the smaller sample size that is used for public companies. In order to analyse discontinuities around the zero threshold properly, a large sample size is required. Although results of Coppens & Peek (2005) do show evidence of earnings management in both public and private companies in the Netherlands, when analysing earnings distributions on their sample of 4188 private- and 840 public companies between 1993 and 1999. Their sample of 840 public companies is comparable to my sample of 671 public companies.

The lack of convincing evidence of earnings management in public companies in my sample might be due various factors. One explanation could be the economic conditions in the period of 2000-2009. The world faced two financial crises in this period of time. The burst of the dotcom-bubble led to a major decline in share prices worldwide and the economic crisis starting in 2007 affected the global economy. Public companies might have suffered more from the two crises because public companies are often more internationally oriented, making them more vulnerable for the global economic conditions. Private companies are more nationally oriented and less exposed to capital market influences and might therefore have suffered less from the global economic circumstances. So, I'm unable to ascertain whether the (partial) lack of evidence of earnings management in public companies is due to the small sample size, other unknown explanations or due to the actual absence of earnings management.

After analyzing the distribution of reported earnings I applied the modified Jones model on my sample to strengthen the evidence of earnings management and to partially rule out other explanations than earnings management. The modified Jones model separates the total accruals into expected (nondiscretionary) and managed (discretionary) accruals. To measure nondiscretionary accruals, the total accruals are regressed on variables that are proxies for normal accruals. The discretionary accruals are calculated as total accruals minus nondiscretionary accruals. My results show overwhelming evidence of earnings management in both public and private companies. Both public and private companies manage their earnings by using discretion over their accruals. The discretionary accruals are 70% of the total accrual in public companies, meaning that earnings management is conducted in a very aggressive manner. Private companies, where the discretionary accruals are 37% percent of the total accruals, are also showing evidence of earnings management. The evidence is somewhat weaker but nevertheless significant. After showing evidence of earnings management in both private and public companies, I conducted a two-sample t test to show that the discretionary accruals in public companies are significantly larger than the discretionary accruals in private companies. This suggests that earnings management by using discretion over accruals is applied more in public than in private companies. However, the results need to be interpreted carefully since I was unable to obtain an estimation period to estimate the proxies. Normally in the modified Jones model, the proxies that are used to estimate the nondiscretionary accruals are derived from an estimation period in which no systemic earnings management in predicted. I was unable to find such a period and derived the proxies from using my own sample. For this particular sample I'm not able to state that I predict that no earnings management in applied. The used proxies might have influenced the results found in my modified Jones test.

The final conclusion, and answer to the central research question of this paper, is that the two models show evidence that both public and private companies in the Netherlands engage in earnings management. I'm unable to provide convincing evidence that earnings management is applied more in either public or private companies. The earnings distribution model shows mixed results, although the evidence of earnings management in private companies is stronger. The modified Jones model shows evidence of more earnings management in public companies.

The results of my research confirm important prior research (see table 1) of Burgstahler & Dichev (1997). They found low frequencies of small decreases and small losses in the distribution of reported earnings. My study also confirms Degeorge et al. (1999), who found that earnings management is driven by the incentive to exceed the zero-threshold, to report (small) positive earnings. The threshold to report small positive profits instead of small losses is psychologically important for assessing a company's performance by it's stakeholders. My results also confirm Vander Bauwhede et al. (2003) and Arnedo et al. (2007), both stating that both public and private companies engage in earnings management.

My results partially confirm prior research of Coppens & Peek (2005). They also found evidence of private companies in the Netherlands avoiding small losses. They did not find evidence of private companies avoiding small earnings decreases, which contradicts my results. Coppens & Peek (2005) also showed strong evidence of public companies managing earnings to avoid reporting small losses and earnings declines. I was not able to find such convincing evidence for my sample of public companies.

The results of my paper do not confirm prior research of Beatty et al. (2002). She found that public banks avoid reporting small decreases in earnings, while she found only weak evidence for private banks doing this. She also found that public banks engage more in earnings management to avoid reporting small decreases than private banks. My results show the contrary, since I show stronger evidence of earnings management in private companies and I'm not able to show convincing evidence of earnings management in public companies using the earnings distribution model. However, the evidence of more discretion in public companies (derived from the modified Jones model), confirms Beatty et al. (2002). My results also contradict the results of Chen et al. (2010). He found that the incentive to avoid reporting earnings declines is stronger than the incentive to avoid reporting losses. My results show the opposite, the evidence of earnings management to avoid reporting losses is stronger, especially for my sample of private companies.

My results show that two frequently used models to detect earnings management can provide contradicting results. Finding evidence of earnings management is depended on the models that is used. It is important for future research to realize this. Since the two models measure different aspects of earnings management, I'm unable to state that one model is better than the other. My results also contribute to literature by confirming that private companies also engage in earnings management, while it was already known that public companies manage earnings. Moreover, finding that private companies also engage in earnings management shows that there are more incentives to manage earnings besides incentives from capital markets. The results of this paper can be important for auditors and investors. It is important to realize that private companies are also managing their earnings to manipulate stakeholders. Users of financial statements should realize that it is very likely that some form of earnings management is applied and that annual reports and earnings information are not necessarily providing useful information about the performance of a company. Stakeholders should keep this in mind when they base particular decisions on the financial report of a company.

This paper has several limitations. I only looked for evidence of earnings management around the zero threshold while there might be effects of earnings management in other intervals that are not adjacent to the zero threshold. I only focus on income increasing activities while earnings management can also be applied to decrease earnings.
The sample that I used includes both consolidated- and unconsolidated statements, earnings management might be conducted at an individual daughter company level, and be reversed on the holding company level or vice versa. I did not include extra tests to exclude the possibility of not detecting earnings management due to the reversal of earnings management effects on different company levels. Another limitation is that I did not use any control variables that can explain the appliance of earnings management. I did not use control variables since Coppens & Peek (2005) showed that their used control variables did not affect the results. However, I'm also not able to rule out the possibility that there is some yet unidentified difference between public and private that might have influenced my results.

A suggestion for future research on earnings management in private and public companies might be to analyze different industries separately. Beatty et al. (2002) and my results show contradicting evidence that might be due to the regulation in particular industries. Some industries are tight to strict regulation and under regulatory oversight while others are to a lesser extend exposed to regulation. It might be interesting to investigate the level of conducted earnings management in different industries in relation to the degree of regulation and regulatory oversight. Furthermore, a lot of evidence of earnings management is not very up-do-date and is derived from samples roughly between 1980 and 1999. Additional research on earnings management using recent data might enable us to detect patterns in the appliance of earnings management. To understand more about earnings management in relation to changing economical circumstances, it might also be useful to show results for the levels of earnings management in individual years, instead of showing one test results for a particular sample period. Investigating separate years might enable us to understand more about the relationship between economical circumstances and the levels of earnings management, and might enable us to make forecasts about expected levels of earnings management.

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Appendix

Additional analysis: The use of different interval widths.

Since the test results of the earnings distribution model are very sensitive to the chosen interval width I conducted additional research. Table 16 shows the t-statistics of the earnings distribution analysis using interval widths of 0.001; 0.005; 0.01.

Table 16. T-statistics earnings distribution model with interval width of 0.001; 0.005; 0.01

Company Status	N	T-statistic					
		Earnings levels			Earnings changes		
interval width		*0.001*	*0.005*	*0.01*	*0.001*	*0.005*	*0.01*
Public	671	-0,6412	1,1257	2,4317**	1,0435	1,0286	2,5242**
Private	18.851	5,0492***	11,4055***	9,0532***	4,8527***	2,6056***	1,9577*

N shows the number of company year observations.

* significantly different from zero at 10% significance level. (t ≥ 1,646)

** significantly different from zero at 5% significance level. (t ≥ 1,962)

*** significantly different from zero at 1% significance level. (t ≥ 2,581)

t-distribution with 1000 degrees of freedom.

Addition analysis: Earnings distribution analysis on the smaller sample.

The sample used in the modified Jones model is smaller than the sample used in the earnings distribution model because of lack of data. I therefore replicated the earnings distribution model using the smaller sample of the modified Jones model. Table 17 shows the mean and standard deviation of total assets; -net income scaled by total assets at t-1 (earnings levels) and -net income changes scaled by total assets at t-1 (earnings changes) using the small sample.

Table 17. Sample summary earnings distribution model (small sample)

Company Status	N	Total assets		Earnings levels		Earnings changes	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Public	386	1.804.902	4.539.507	0,0449	0,1166	0,0121	0,1227
Private	5.249	147.313	496.267	0,0574	0,1133	0,0095	0,1234

N shows the number of company year observations.

Total assets in thousands of EUR.

Table 18 shows the t-statistics of the earnings distribution analysis using interval widths of 0.001; 0.005; 0.01 on the small sample.

Table 18. T-statistics earnings distribution model with interval width of 0.001; 0.005; 0.01 (Small sample)

Company Status	N	T-statistic					
		Earnings levels			Earnings changes		
interval width		*0.001*	*0.005*	*0.01*	*0.001*	*0.005*	*0.01*
Public	386	-0,8014	0,4611	1,9592*	1,2002	1,1451	2,2475**
Private	5.249	5,9948***	5,6160***	5,9122***	2,3774**	2,3143**	2,2105**

N shows the number of company year observations.

* significantly different from zero at 10% significance level. (t ≥ 1,646)

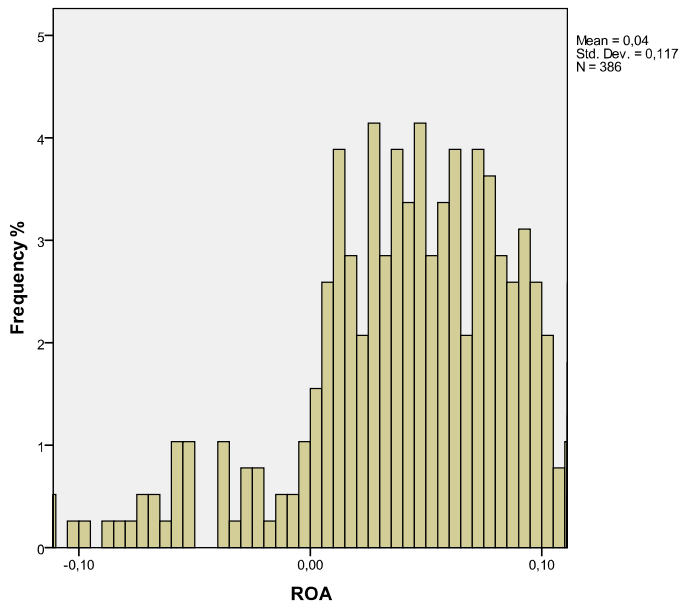** significantly different from zero at 5% significance level. (t ≥ 1,962)

*** significantly different from zero at 1% significance level. (t ≥ 2,581)
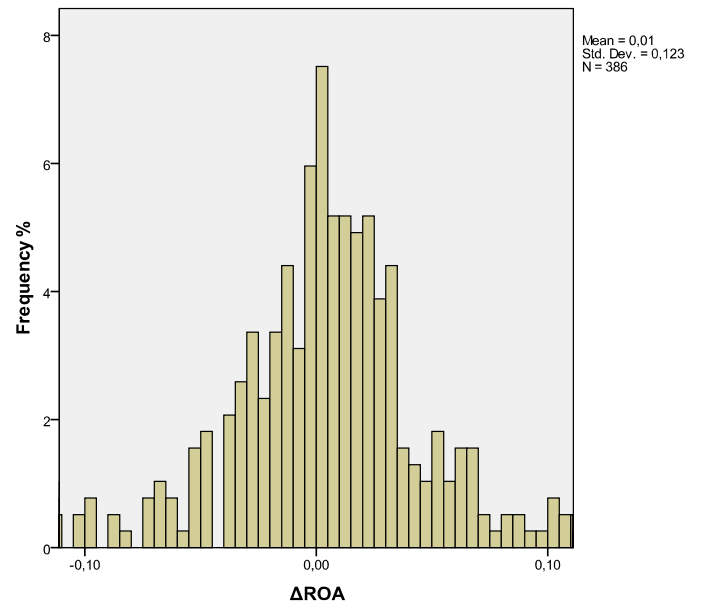
t-distribution with 1000 degrees of freedom.

Figure 2 shows the distribution of the reported income (ROA) and changes in reported income (ΔROA) scaled by total assets at t-1 around the zero threshold for both private and public companies using the small sample. The chosen interval width is 0.005.
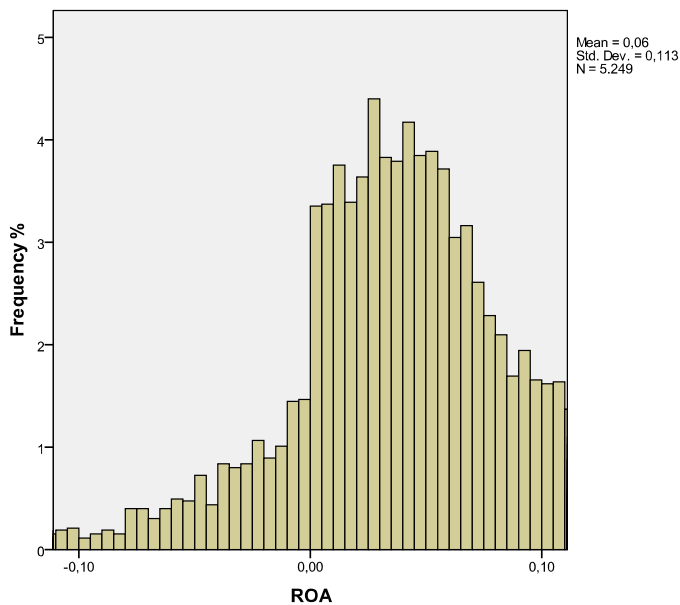
Figure 2

A. Net income in public companies

B. Changes in net income in public companies

C. Net income in private companies

D. Changes in net income in private companies