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Earnings Management in Public and Private Companies – Evidence from Finland

ABSTRACT

The paper studies earnings management in public and private companies and whether earnings management is a function of leverage. A matched sample with 99 public and 99 private Finnish companies is used.

Earnings management is difficult to measure and several different approaches are used to identify earnings management. Firstly, following several prior studies, discretionary accruals, the ratio of small profits to small losses, the variation in earnings in relation to the variation in cash flows and the correlation between the change in earnings and the change in cash flows are used as measures of earnings management. Secondly, a number of specific accruals are studied, namely the depreciation, the amortization of goodwill and the recognition of impairment losses. Thirdly, whether companies use the timing of asset sales and other gains reported as a non-operating income as a way to manage earnings is studied.

The main findings are as follows: contrary to studies of U.K and U.S. data, this paper finds no significant differences in the accounting choice / earnings management measures between public and private companies. Furthermore, some of the measures used indicate that highly leveraged companies are more likely to use income increasing accounting methods than companies with a low leverage. However, the impact of leverage on accounting choices does not differ significantly between private and public companies.

Keywords: earnings management, ownership structure, private companies, leverage

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1. INTRODUCTION

Earnings management can be defined as a situation where managers use judgment in financial reporting or in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance or to influence contractual outcomes (Healy and Wahlen, 1999). The paper studies earnings management in public and private companies and whether earnings management is a function of a company's leverage.

Public and private firms differ in two respects that potentially have implications for their incentives to manage earnings. First, lower concentration of ownership in public firms and lower managerial ownership implies that accounting has a more important role in performance evaluation (e.g., Ke et al., 1999). The possible effect of this is that managers of public companies are more likely to manage earnings in order to either maximize accounting based bonuses (e.g. Guidry et al., 1999) or avoid reporting a poor profit that would result in dismissal of the manager (e.g. Fudenberg and Tirole, 1995). A second consequence of a more diffuse ownership in public firms is that accounting has a more important role in communicating with current and prospective shareholders (Ball and Shivakumar, 2005).

Based on the differences between private and public companies, a number of papers present evidence consistent with the view that public firms are more likely to manage their earnings than private firms (Beatty and Harris, 1999; Beatty et al., 2002). Ball and Shivakumar (2005) on the other hand, argue that the greater exposure of public firms' financial reports creates a demand for higher quality reporting and present evidence consistent with this view. Burgstahler et al. (2005) also found that private firms are more likely to manage their earnings than public firms.

The second issue studied in this paper is the association between leverage and earnings management. Several studies have found that companies with a high leverage use income increasing accounting methods (see Holthausen and Leftwich, 1983). A reason for this is that companies approaching debt covenant violations respond with income-increasing accounting methods (see Fields et al., 2001 for a review of the literature). However, Press and Weintrop (1990) point out that other factors than debt covenants contribute to the association between leverage and accounting choices.

The sample consists of 545 firm-year observations of 99 public and 99 private Finnish companies. The data covers the 1997–2001 period, i.e., before the International Financial Reporting Standards (IFRS) became compulsory for public companies in the EU. The accounting rules were almost identical for public and private companies during this period of time. Thus, it enables a study of the possible effects of reporting incentives and firms' public exposure on actual reporting practices.

The accounting rules during the sampling period are less detailed and thereby allow a greater number of alternative accounting methods than the IFRS standards. However, the legal

system is generally believed to be strong in Finland, in the sense that laws are enforced and courts are efficient (LaPorta et al., 1998). Thus, Finland had relatively flexible accounting methods but at the same time soundly enforced the rules. Most of the rules that were in effect during the sampling period are still in effect for non-public companies.

The paper studies a more extensive range of measures of earnings management and earnings quality than in related prior studies. Three sets of earnings management measures are used: Firstly, a number of "aggregate measures" aimed to capture a wide range of different ways to manage earnings are used. These measures follow prior studies (e.g., Burghstahler et al., 2005; Coppens and Peek, 2005), and the set of proxies used include discretionary accruals, the ratio of small profits to small losses, the variation in earnings in relation to the variation in cash flows, and the correlation between the change in accruals and the change in cash flows. Secondly, a number of specific accrual items are studied, comprising depreciation policy, the amortization of goodwill, and the recognition of impairment losses. Thirdly, whether companies use the timing of asset sales and other gains reported as a non-operating income or an extraordinary item as a way to manage earnings is used as an indicator of earnings management.

The advantage of using an aggregate measure is that the examination of only one accounting choice at a time may obscure the overall effect of earnings management, as it is possible that the aggregate effect of several accounting choices is significant even if a single accounting choice is insignificant. One advantage of the study of specific accounting choices and real transactions is that it improves the possibilities to separate earnings management stemming from the use of judgment in reporting from earnings management via real transactions. Note that high quality accounting standards and auditing can reduce earnings management stemming from accounting choices but not earnings management stemming from real transactions.

The main findings in the paper are as follows: Contrary to evidence from U.K, U.S. and other European countries this study shows that there are no significant differences in the earnings management / accounting choice measures between the public companies and the private companies. Ball and Shivakumar (2005), who studied a sample of U.K firms, and Burgstahler et al. (2005), who studied a sample with companies from several European countries, found that the quality of earnings is higher in public companies than in private ones. Beatty and Harris (1999) and Beatty et al. (2002), who studied U.S. companies, found that public companies are more likely to manage their earnings than private companies. There are no prior studies of the differences in the reporting between public and private Finnish companies.¹

¹ There is a number of papers studying other aspects of earnings management among listed companies in Finland. Kinnunen et al. (2000) ask whether companies manage earnings around stock issues, and Kasanen et al. (1996) study whether earnings management is dividend-driven.

A further finding is that leveraged companies tend to be more likely to use income increasing accounting methods than companies with a low leverage, albeit some of these results are inconclusive. Additionally, no statistically significant differences in the associations between leverage and the choices of accounting methods are found between the public and private companies.

The finding that leveraged companies use income increasing accounting methods is in line with the results in several prior studies (see Sundgren and Johansson, 2004; Holthausen and Leftwich, 1983). Sundgren and Johansson (2004) (S&J) studied also small and mid-sized Finnish companies; however, a difference between this study and S&J is that consolidated data was used in this study while data from the separate financial statements (that is, the parent companies or subsidiaries if a company belonged to a corporate group) was used by S&J.

The rest of the paper is organized as follows. Section two presents relevant accounting laws and standards. Section three reviews prior research on earnings management in public and private companies as well as research on the association between earnings management and leverage. The research questions of the paper are also set forth in section three. Section four discusses proxies of earnings management and section five presents the data used. The main results of the study are reported in section six and section seven includes some concluding remarks.

2. FINNISH ACCOUNTING LAWS AND REGULATIONS

The data covers a time period before the International Financial Reporting Standards (IFRS) became compulsory for public companies. Public and non-public companies followed basically the same accounting laws and regulations until the beginning of 2005 when IFRS became obligatory for the consolidated reports of public companies.^{2,3}

The fact that the accounting rules were almost similar for public and private companies during the sample period made it possible to study the possible effects of reporting incentives and firms' public exposure on actual reporting practices. The rules related to the specific accounting choices studied in the empirical section of the paper are briefly explained below. These rules in the Accounting Act are still in effect for non-public companies as well as for parent companies

2 The main sources of the current Finnish accounting regulation are the Accounting Act (Bokföringslag) 1336 / 1997, the Accounting Ordinance (Bokföringsförrordning) 1339 / 1997 as well as regulations by the Finnish Accounting Standard Board (Bokföringsnämnden).

3 There were some additional regulations for public companies in other laws than the Accounting Act as well as in the following regulation by the Finnish Accounting Standard Board: "Uppgörande av bokslut, bokslutskommuniké och delårsrapport i enlighet med finansministeriets förordning (538/2002)". It stipulates that public firms shall prepare interim accounts, require some additional notes of public companies and specify the calculation of some financial ratios to be included in the financial statements.

and subsidiaries in groups with publicly traded securities unless they are voluntarily preparing their accounts according to IFRS.⁴

Depreciation and amortization: The Accounting Act (5:5) stipulates that tangible assets shall be depreciated over their useful lives. Some more guidance with respect to, among other things, the calculation of the cost for purchased and self-constructed assets, depreciation methods and residual values are included in a regulation by the Finnish Accounting Standard Board.⁵ The rules in the regulation are mostly similar to those in IAS 16, albeit the international standard provides more detailed guidance in several respects.

One difference between the Finnish and IAS/IFRS regulations is that the Finnish rules put fewer restrictions on the types of intangible assets that can be recognized as an asset in the balance sheet. For example, companies were allowed to recognize start-up costs, research expenditures and development expenditures as an asset during the sampling period. Starting from 2005 research expenditures and start-up costs shall be expensed immediately, however.

Furthermore, the Accounting Act stipulates maximum useful lives for goodwill and some other intangible assets. The Accounting Act (5:5a)⁶ stipulates that goodwill shall normally be amortized over five years but a longer period can, under certain conditions, be used. The amortization period can not exceed 20 years, however. The regulation from the Finnish Accounting Standard Board mentioned above includes also some further guidance with respect to the amortization of intangible assets. For example, it is pointed out that the principle of prudence shall be followed whenever a company is considering whether to recognize development expenditures as an asset.

Impairment losses: According to the Accounting Act (5:13), an impairment loss shall be recognized if the expected income associated with a long-lived asset is lower than its carrying value. A regulation from the Finnish Accounting Standard Board includes some further guidance related to the recognition of impairment losses.⁷ The expected income associated with an asset, also called the "recoverable amount" can either be determined as the net selling price or as the value in use. The regulation points out that the value in use can be used as the recoverable amount for property plant and equipment but that selling prices shall in general be used for investments. Furthermore, the regulation stresses that companies shall follow the principle of prudence in estimates. However, the regulation provides little guidance for example in comparison

⁴ Section 3 in Chapter 7a in the Accounting Act gives non-public companies as well as judicial persons the option to prepare their accounts according to IFRS although the Accounting Act does not require them to do so.

⁵ The guidance is in "Allmän anvisning om avskrivningar enligt plan" issued 27.9.1999. The rules in the previous version of the regulation from 1993 were basically similar.

⁶ The rule was in section 5:9 in the Accounting Act between 1997 and 2004.

⁷ See "Allmän anvisning om avskrivningar enligt plan" issued 27.9.1999 at pp. 24–25.

with IAS 36. Thus, it leaves much room for judgment to companies with respect to the timing and amounts of asset write-downs.

Other operating income and extraordinary income: The empirical section of this paper reports the study of whether companies both sell assets as well as realize other gains or losses in order to attain desired earnings. Such gains are typically recognized as “other operating income”⁸ or as extraordinary income. An income shall be classified as extraordinary if it arises from a transaction that is not expected to recur frequently and is clearly distinct from the ordinary activities of the company (see the Accounting Act, 4:2). Gains on asset sales are normally reported as “other operating income”, but can also be reported as “extraordinary income”. The proposition to the Accounting Act HE 173–1997vp points out that sales of assets used in the normal course of business are to be accounted for as “other operating income”; however, if a company disposes a whole business segment, it shall be recognized as extraordinary income.⁹ Income from rents is another example of income frequently accounted for as “other operating income”.

3. RELATED LITERATURE

3.1 The Incentive to Manage Earnings in Public and Private Companies

Observed earnings management is a function of incentives to manage and factors limiting the possibilities to manage earnings (e.g., Ball et al., 2003). Studies suggest that public and private companies differ in the following important ways.

Separation of ownership and control: An important difference between public and private companies is that public companies are less likely to be managed by their key owners and in general have a much more dispersed ownership. This implies that there are greater demands to link pay to performance for managers of public companies. Several studies suggest that bonus contracts can give managers the incentive to manage earnings (see Fields et al., 2001 for a review). Indeed, many privately held companies have external managers: However, the higher ownership concentrations in private companies give shareholders greater incentives to monitor the management (Schleifer and Vishny, 1986). A possible consequence of this is that incentive contracts become less important (Ke et al., 1999).

The separation of ownership and control can also give incentives to manage earnings in the absence of explicit bonus contracts (e.g., DeFond and Park, 1997; Elgers et al., 2003). These studies are partly based on Fudenberg and Tirole’s (1995) prediction that managers smooth earnings in order to avoid reporting an extremely low profit during poor years that would result in the

⁸ The terms “liiketoiminnan muut tuotot” and “övriga rörelseintäkter” are used in Finnish and Swedish.

⁹ See the proposal to the Accounting Act HE 173–1997vp.

dismissal of managers. The more concentrated ownership in private companies gives owners the incentive to monitor extensively, which reduces the role of reported earnings for performance evaluation. Altogether, a more pronounced separation of management and control in public companies is likely to increase the incentives to manage earnings.

Financial statements as means for communication: Financial statements of private and public companies fulfil partly different roles. One potentially important role in public companies is to constitute a means for communication between the company and current as well as prospective shareholders. Ball and Shivakumar (2005) point out that a consequence of this is that the market demands higher quality earnings from public companies. Investors would be reluctant to supply capital to firms with low quality financial statements or demand a higher cost of capital if the financial statements were of low quality (see Burgstahler et al., 2005). Indeed, private companies have at least partly similar incentives, as they want to reduce the cost of debt capital. Furthermore, private companies may plan to go public in the future.

Contrasting with this view are a number of studies providing evidence that public companies manipulate earnings in order to influence share prices, for example, around equity issues (Teoh et al., 1998; Rangan, 1998) and around acquisitions (e.g., Erickson and Wang, 1999).

Corporate control: Managers of public firms may also be concerned that the firm will be acquired by an outsider at a price below its intrinsic value, and that they lose their job as part of the acquisition (e.g., Grinblatt and Titman, 1998: 634). A consequence of this is that public companies have the incentive to use income increasing accounting methods in order to avoid underpricing of shares.

Factors restricting earnings management: High quality accounting standards have generally been considered as a key variable affecting the quality of accounting (e.g., Levitt, 1998). A trend in the US, in Europe as well as in other parts of the world, is that accounting standards are becoming increasingly complex and detailed. The Finnish accounting laws and standards are less detailed and are thus more flexible than the International Financial Reporting Standards. However, the enforcement of laws is in general believed to be sound in the Scandinavian countries (e.g., Laporta et al., 1998). **The compliance with accounting standards is enforced by the auditing function.** Using a Big 5 / non Big 5 dichotomy as the measure of audit quality, there are a number of studies suggesting that a high quality audit reduces the incident of earnings management (e.g., Francis et al., 1999; Krishnan, 2003; Bauwhede et al., 2003). Finnish public companies hire Big 5 auditors more often than non-public companies (Knechel et al., 2005).

A further factor that limits the incentive to manage earnings is that a firm and its managers can have the incentive to build up a track record for unbiased reporting (Palepu et al., 2004: 13-7). Such reputation capital is also likely to be valuable for private firms, for example, if they would go public in the future. Finally, monitoring by financial analysts does also limit management's

ability to manage earnings in public companies. Financial analysts have in many cases firm-specific and industry-specific knowledge that enables them to assess the quality of reported financials (Palepu et al., 2004: 13-7).

To conclude, this review of the literature suggests that capital market pressures and the separation of ownership and control give the management of public companies a greater incentive to manage earnings than private companies. On the other hand, analyst coverage and managers' reputation concerns are likely to restrict earnings management more in public companies than in private companies.

The empirical literature is also inconclusive. Some recent studies suggest that the quality of the financial reporting is lower for private companies than for public companies (Ball and Shivakumar, 2005; Burgstahler et al., 2005). However, other studies suggest that the quality of the reporting is higher in public companies (Beatty and Harris, 1999; Beatty et al., 2002). Indeed, possible reasons for the inconclusive results are that different measures of earnings management have been used and that sample compositions differ. Burgstahler et al. (2005) suggest that strong legal systems are associated with less earnings management. They also found that institutional factors, such as book-tax alignment, affect earnings management.

The discussion above can be summarized in the following research question:

RQ 1: Are public companies more likely to manage earnings than privately held companies?

3.2 Leverage and Earnings Management

The second issue studied in the paper is the association between leverage and earnings management. Several studies have found that companies with a high leverage use income increasing accounting methods (see Holthausen and Leftwich, 1983). A reason for this is that companies approaching debt covenant violations respond with income-increasing accounting methods (e. g., Sweeney, 1994; and DeFond and Jiambalvo, 1994). However, Press and Weintrop (1990) point out that also other factors than debt covenants contribute to the association between leverage and accounting choices.

Bowen et al. (1995) suggest that considerations towards stakeholders, such as customers, suppliers and short term creditors, give companies the incentive to manage earnings although there are no explicit contracts related to accounting numbers. Banks lending on a relatively short-term basis are likely to study financial statements carefully when loans are about to be granted or renewed. However, if creditors do not completely adjust accounting numbers for differences in accounting methods, companies having used income increasing accounting methods will be perceived as being less risky. Suppliers might for similar reasons sell on more favourable terms to firms having used income-increasing accounting methods. Titman (1984) argues that customers

care about the future of a company if they expect future services, such as new versions of a computer program or repairs of products, from the supplier. The use of income-increasing accounting methods may improve the financial image of firms as perceived by customers.

Furthermore, the liquidation rules in the Finnish Company law give financially troubled firms the incentive to use income-increasing accounting methods. These rules stipulate that a firm should initiate liquidation if losses have consumed the retained earnings and paid in capital to the extent that shareholders' equity is less than half the book value of the share-capital.

All in all, the discussion above suggests that companies with a high leverage would be more likely to use income increasing accounting methods. However, the correlation may differ between public and private companies. Ball and Shivakumar (2005) point out that the market is likely to demand higher quality earnings from public companies than from private ones. If this argument were true, one would expect a stronger association between leverage income-increasing earnings management among private companies than among public ones.

The discussion in this section can be summarized in the following research questions:

RQ 2: Are companies with a high leverage more likely to manage earnings than companies with a low leverage?

RQ 3: Is the association between the leverage and earnings management stronger for private companies than for public ones?

4. MEASURES OF EARNINGS MANAGEMENT

The paper uses some "aggregate measures", measures of specific accounting choices and measures of the use of real transactions, in order to measure earnings management. In this section the measures used are presented in more detail. The control variables and statistical methods are discussed together with the analyses in section five.

"Aggregate measures" in this paper indicates measures of discretionary accruals, the ratio of small profits to small losses, the ratio of the variation in earnings to cash flows, the correlation between the change in cash flows and change in accruals as well as other measures aimed to capture a large range of different earnings management activities.

The advantage of using such an aggregate measure is that the examination of only one accounting choice at a time may obscure the overall effect of earnings management since it is possible that the aggregate effect of several accounting choices is significant even if single accounting choices are insignificant (see Fields et al., 2001: 288). Thus, at least for small samples, the use of aggregate measures reduces the likelihood that a hypothesis of earnings management is incorrectly rejected.

However, discretionary accruals, as well as other proxies measure earnings management with error (e.g., Burgstahler et al., 2005: 36). Thus, results based on aggregate measures are vulnerable for problems with unobserved correlated omitted variables. The risks of omitted correlated variables are less likely to be a problem if specific accruals are used since it facilitates the use of fine tuned control variables.

A second advantage of the study of specific accounting choices and real transactions is that it improves the possibility of separating earnings management stemming from the use of judgment in reporting from earnings management via real transactions. Note that high quality accounting standards and auditing can reduce earnings management stemming from accounting choices but not earnings management stemming from real transactions.

Aggregate measures: The following aggregate measures are used in the paper: first, the discretionary accruals using the DeAngelo-model are calculated.¹⁰ The discretionary, or unexpected, accruals are calculated as the current year's accruals less the previous year's accruals with this model (see DeAngelo, 1986; and Dechow et al., 1995 for discussions of the model).¹¹ Following some prior studies, the absolute value of the discretionary accruals are used (e.g., Francis et al., 1999). The discretionary accruals according to the DeAngelo-model are denoted $ABS[DACCR]$ in the analyses below.

The three final measures are taken from Leutz et al. (2003). The measures have also been used by Tandeloo and Vanstraelen (2005) and Burgstahler et al. (2005). The second measure used is the ratio between small profits and small losses. The ratio is calculated using earnings before appropriations made for taxation purposes but after taxes in relation to lagged assets.¹² A firm-year is classified as a small profit (small loss) if the earnings measure fall within the range of two percent.¹³ The ratio is denoted $PROF/LOSS$ in the analyses below.

The third measure used is the standard deviation of earnings in relation to the standard deviation of cash flows. ($STD[PROF/CF]$). The standard deviations of earnings and cash flows over a

¹⁰ Some studies suggest that versions of the Jones model perform better than the DeAngelo model (e.g., Dechow et al., 1995). However, the DeAngelo-model is used here since I do not have long enough time series to use a time-series version of the Jones model. Furthermore, many of the companies in the sample are operating in several industries implying that it is not appropriate to use a cross sectional model and estimate the model by year and industry, which has been the practice in many studies.

¹¹ The accruals ACCR are calculated as: $ACCR = (INV_t - INV_{t-1}) + (REC_t - REC_{t-1}) + (PREEXP_t - PREEXP_{t-1}) - (TRADE_t - TRADE_{t-1}) - (ACCEXP_t - ACCEXP_{t-1}) - (ADVREC_t - ADVREC_{t-1}) - DEPR_t$, where INV is inventories; REC is receivables; PREEXP is prepaid expenses and accrued income; TRADE is trade accounts payable; ACCEXP is accrued expenses and prepaid income; ADVREC is advances received and DEPR is depreciation and amortization.

¹² The profit before appropriations is more likely to be used as a criterion to judge the performance of firms than the reported net income since the reported net income is affected by the change in differences between depreciation made for taxation purposes and the depreciation charge for financial purposes.

¹³ A one-percent range has been used in prior studies (e.g., Burgstahler et al., 2005), but a slightly wider interval is used since the sample studied is relatively small.

four-year period are used in the calculations. A lower variation in earnings in relation to the variation in cash flows indicates that the company is smoothing its income.

The correlation between the change in accruals and the change in cash flows is used as the fourth “aggregate measure”. The measure is taken from Leutz et al. (2003), and it also attempts to capture the level of income smoothing. It measures the correlation between the change in accruals and the change in cash flows and is denoted $\rho_{[DCF, DACCR]}$ in the analyses below. A negative correlation is a natural result of accrual accounting. However, a more negative ratio indicates that a company is using accruals in order to smooth its income stream (see Leutz et al., 2003).

Specific accruals items: The paper studies three specific accruals items that are exclusively functions of accounting choices, namely: amortization of goodwill, depreciation and amortization of other assets than goodwill and the recognition of impairment losses. The ratio of the current year’s depreciation and amortization (excluding goodwill) in relation to the depreciable assets ($DEPR$) is used as the measure of depreciation policy. A high value of $DEPR$ indicates, ceteris paribus, that a company uses more conservative policies and thus shifts reported earnings from the current period to future periods.

The amortization of goodwill in relation to the balance sheet amount before the current year’s amortization ($AMORT$) is used as the measure of the amortization policy. As above, a higher value indicates, ceteris paribus, that a company uses short useful lives for goodwill and thus shifts reported earnings from the current period to future periods.

The recognition of impairment losses is measured with the ratio of impairment losses in the income statement in relation to the lagged assets ($IMPAIR$). Controlling for other factors, higher impairment losses indicate that a company uses more conservative accounting methods and that it recognizes economic losses in a more timely way (cf. Ball and Shivakumar, 2005).

Real transactions: Companies can sell assets as well as realize other gains or losses in order to attain desired earnings (e.g., Beatty and Harris, 1999). Such gains and losses are typically recognized as a non-operating income or as an extraordinary item. Studies suggest that companies avoid reporting earnings decreases (e.g., Burgstahler and Dichev, 1997). Beatty et al. (2002) found that public banks to a larger extent avoid earnings decreases than private companies. If this result applies for Finnish non-financial companies, one would expect a more negative correlation between the change in performance and the change in non-recurring items among the public companies than among the private companies in the sample. Non-recurring items are reported as an “other operating income” or as an extraordinary item in Finland. The first ratio used in the analyses is the change in other operating income ($\Delta_{OTHEROP}$), calculated as the current year’s other operating income less the previous year’s other operating income scaled by lagged total assets. The second ratio used is the change in extraordinary income measured with Δ_{EXTINT} . The calculations of the variables are explained in Table 1.

5. SAMPLE AND DESCRIPTIVE STATISTICS

5.1 Sample selection

The sample used for this study consists of 99 public and 99 non-public Finnish firms. 274 firm-years for the public firms and 271 firm-years for the non-public firms are used in the analyses. The data covers the 1997–2001 period and is taken from the Voitto-database. This database includes financial statements for firms that have either sent the financial statements themselves to Asiakastieto Oy¹⁴, or that have filed the financial statements with the Patent and Registration Office (PRH). Consolidated financial statements are used.

The sample was composed at the outset of all firm-years with an income statement classified by nature and for which two lags of data were available.¹⁵ This resulted in an initial sample of 271 observations for firms listed at the HESE stock exchange and 3263 observations for non-public firms.

Public firms are considerably larger than the non-public ones. In order to control for the field of industry and at least partly for size, a matched sub-sample was composed. The matching was done as follows: First, industry was checked for all non-public firms whose assets exceeded EUR 33 million. However, in two fields of industry where it was difficult to find a match, smaller firms were studied.¹⁶ Starting from the largest non-public firms, corresponding firms were considered for being a suitable match for any of the 99 public companies. Co-operations (“andelslag”), state-owned companies, and subsidiaries of other companies (including subsidiaries to foreign public companies) were not used as matches. If several potential matches were available, a family owned company was used as the match in the first place.¹⁷ Information about the field of industry in which the companies operate was taken from Voitto.¹⁸ It was possible to find a match at the four-digit level for 33 companies, at the three-digit level for 10 companies, at a two-digit level for 27 companies and at the one-digit level for 21 companies. A match for the remaining 9 companies was based on closeness of the fields of industry even if the industry codes were different.¹⁹ The companies included in the sample are presented in an Appendix.

¹⁴ Asiakastieto Oy is a Finnish business and credit information company. Asiakastieto maintains the Voitto database.

¹⁵ This condition was necessary in order to have data about depreciation that was used in order to calculate accruals and to study the depreciation policy of the companies.

¹⁶ It was difficult to find matches particularly for companies in the real estate sector (industry code 7020) and for computer programming and services (7220). For these fields of industry all companies with consolidated financial statements available in Voitto were investigated in order to find appropriate matches.

¹⁷ Most of the companies in the sample had a web site that included some information about the ownership structure.

¹⁸ The industry classification was in some cases difficult since the companies operated in many fields of industry. The sales of the companies included in the group were then checked in order to establish in which main fields of industry the companies were operating.

¹⁹ In four of these eight cases the match had significant operations in the same field of industry as the corresponding public firm even if it was not the main operations (measured with sales) for the company in question. In two cases manufacturing firms with first digit 3 (electric equipment) were matched with other manufacturing firms (first

TABLE 1. Variable definitions.

Variable	Definition
ABS[DACCR]	The absolute value of discretionary accruals using the DeAngelo model. Discretionary accruals are calculated as accruals year t less accruals year t-1
AMORT	Amortization of goodwill* / (Amortization of goodwill* + balance sheet amounts of goodwill)
CASH	(Cash + short term investments) / lagged assets
CFTA	Cash flow is calculated as earnings before extraordinary items but after taxes* less accruals / lagged assets. Accruals are defined as the (i) increase in inventories, receivables and prepaid expenses and accrued income, (ii) less the increase in trade accounts payable, accrued expenses and prepaid income and advances received and less (iii) depreciation, amortization and impairment losses
DACCR	(Current year's accruals – one lag of accruals) / one lag of total assets
DCF	(Current year's cash flow from operations – one lag of cash flows from operations) / lagged assets
DEPR	Depreciation and amortization (excluding goodwill)* / (depreciation and amortization except goodwill* + buildings + machinery and equipment + other tangible assets + pre-opening and start up costs + research and development + some other intangible assets (e.g., patents, computer software))
ΔDEPRASSETS	(Current year's depreciable assets – two lags of depreciable assets) / Two lags of depreciable assets. The depreciable assets are defined as: buildings + machinery and equipment + other tangible assets + pre-opening and start up costs + research and development + some other intangible assets
ΔEXTINT	(Current year's extraordinary income* – one lag of extraordinary income) / lagged assets
ΔINC	(Current year's earnings† + extraordinary items* – non-operating income less one lag of earnings + extraordinary items – non-operating income) / lagged assets †Earnings before appropriations made for taxation purposes but after taxes is used
ΔOTHEROP	(Current year's other operating income* – one lag of other operating income) / lagged assets
ΔTOTASSETS	(Current year's total assets – two lags of total assets) / two lags of total assets
IMPAIR	Impairment losses / lagged total assets
INTANGIBLE	(Pre-opening and start up costs + research and development + some other intangible assets) / (buildings + machinery and equipment + other tangible assets + pre-opening and start up costs + research and development + some other intangible assets)
LEVER	Total liabilities / total assets
LNASSETS	Natural logarithm of total assets
LNGOODWILL	Natural logarithm of ((current year's goodwill – two lags of goodwill) / two lags of goodwill)+2)
MACHINE&EQ	Machines and equipment / (buildings + machinery and equipment + other tangible assets + pre-opening and start up costs + research and development + some other intangible assets (e.g., patents, computer software))
PROF / LOSS	PROF takes the value one if the company reports a small profit and LOSS takes the value one if a company reports a small loss. A firm-year is classified as a small profit (small loss) if the profit (or loss) falls within the range of two percent. The following profitability measure is used: (profit before appropriations made for taxation purposes – taxes) / lagged assets.
PROFTA	Profit before change in appropriations made for taxation purposes less taxes* / lagged total assets
PUBLIC	A dummy variable taking the value one if the company is publicly traded and zero otherwise
Q4LEVER	A dummy variable taking the value one if LEVER is higher than 62.65%. One-fourth of the companies in the sample has a leverage over 62.65%
(STD[PROF/CF])	PROF is calculated as profit before extraordinary items and appropriations made for taxation purposes – taxes. CF is calculated as earnings before extraordinary items but after taxes less accruals. The standard deviations of PROF and CF over a four-year period are used.
TANGIBLE	

*Adjusted to correspond with a 12-month long period

digit 2), in one case a construction company was used as a match for a company that owns real estate and in one case it was found out that the match had changed it operations from printing to computer programs. Correspondingly, it was used as a match for a computer firm.

To acquire some insight into how the sampling strategy affects the results, the public firms are also compared with the entire sample of 1364 non-public firms (3263 firm-years). The mean (median) assets of these companies are € 40.06 million (€ 6.48 million). The results based on this sample are commented in a footnote or in the text if they are substantially different from the ones reported in the main tables in the paper.

5.2 Descriptive Statistics

The sizes as well as descriptive statistics for the other variables used in this study are reported in Table 2. The largest companies in many fields of industry are public firms and it was not always possible to find matches of the same size. Consequently, the private firms are smaller than the public ones in the sample. The mean (median) sales of the public firm-years are EUR 855.7 million (EUR 100.7 million) and for the private firms EUR 148.7 million (EUR 69.2 million). The mean (median) total assets of the public and private firms are EUR 977,1 million (EUR 114,1 million) and EUR 116,2 million (EUR 58,8 million) respectively.

The profitability of the private companies is slightly better than that of the public ones. The average net income (before possible appropriations made for tax purposes) in relation to lagged assets is 6,5% for the public companies and 8,5% for the private ones (p-value = 0.0527). The cash flow to lagged assets is also higher for the private firms. The leverage of the companies is almost similar, however. The mean leverage, measured as total liabilities in relation to total assets, is 50,3% for the public companies and 50,7% for the private companies.

6. RESULTS

6.1 Aggregate Measures of Earnings Management

Table 3 presents results for the aggregate measures of earnings management. Results related to $ABS[DACCR]$ are presented in Panel A of the table. The panel includes a comparison of means and medians, the rank correlation as well as the regression coefficients from the following regression:

$$(1) \quad ABS[DACCR] = \alpha + \beta_1 \text{PUBLIC} + \beta_2 \text{LEVER} + \beta_3 \text{LEVER} * \text{PUBLIC}$$

A negative β_1 is expected if public companies are less likely to manage their earnings, a positive β_2 is expected if leveraged companies are more likely to manage their earnings and a negative β_3 is expected if the correlation between the leverage and the measure of earnings management is weaker among public than among private companies.

A higher value of $ABS[DACCR]$ would indicate that a company is more likely to manage its

TABLE 2. Descriptive statistics.

	Private companies		Public companies		T-value
	Mean	Median	Mean	Median	
ASSETS (thousand €)	116227.1	58811.5	977130.5	114134.5	4.84***
SALES (thousand €)	14874	69200.6	855702.9	100729.9	5.58***
AMORT	0.309	0.171	0.232	0.133	1.88*
CASH	0.165	0.087	0.192	0.096	0.97
CFTA	0.119	0.106	0.084	0.089	2.79***
DACCR	0.002	0.001	0.006	-0.004	0.36
DCF	0.009	0.003	-0.003	0.007	0.99
DEPR	0.149	0.130	0.148	0.131	0.10
ΔDEPRASSETS	0.190	0.099	0.454	0.156	4.62***
ΔEXTINT	0.002	0	-0.0001	0	0.43
ΔINC	0.005	0.001	-0.007	0.001	1.91*
ΔOTHEROP	0.003	0.001	0.010	0.002	1.61
ΔTOTASSETS	0.234	0.148	0.536	0.203	4.43***
IMPAIR	0.001	0	0.001	0	0.48
INTANGIBLE	0.069	0.033	0.094	0.057	2.88***
LEVER	0.507	0.523	0.503	0.535	0.26
MACHINE&EQ	0.460	0.482	0.459	0.458	0.04
LNGOODWILL	0.704	0.529	1.214	0.670	4.01***
PROFTA	0.085	0.067	0.065	0.056	1.94*
Q4LEVER	0.266	0	0.233	0	0.91

Notes:

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

earnings. However, it can be seen from Table 3 that the mean (median) value are close to identical for the public and non-public companies (p-value for t-test 0.503). Furthermore, it can be seen from Table 3 that the coefficient of LEVER is small and insignificant indicating that earnings management does not depend on leverage. The interaction between LEVER and PUBLIC is also insignificant.

Panel B in Table 3 compares the ratio of small profits to small losses among the public and private companies. A firm-year is classified as a small profit (small loss) if PROFITA falls within the range of two percent. 73,81% of the public companies reported a small profit and 26,19% reported a small loss. The corresponding figure for the non-public companies are 53,33% and 46,67%. Thus, the ratios of small profits to small losses (PROF/LOSS) are 2,82 for the public firms

and 1,14 for the non-public companies. The proportions are significant at the 10% level using a chi-square test (p-value 0.072).²⁰

The PROF/LOSS ratio was also studied using the reported net-income, the profit before extraordinary items but after taxes and for a one-percent interval using PROFTA. These results showed that the ratio was slightly higher for the public companies than for the private companies; however, the difference was not significant.

In Panel C STD[PROF/CF] is used as the measure of earnings management. The ratio is calculated based on the standard deviations of earnings and cash flows over a four-year period. A lower ratio indicates that a company is more likely to smooth its income. As above, a regression is used in addition to the univariate results in order to study the research questions:

$$(2) \quad \text{STD[PROF/CF]} = \alpha + \beta_1 \text{PUBLIC} + \beta_2 \text{LEVER} + \beta_3 \text{LEVER} * \text{PUBLIC}$$

A positive β_1 is expected if public companies are less likely to smooth their income stream, and consequently less likely to manage their earnings. A negative β_2 is expected if leveraged companies are more likely to manage their earnings, and a positive β_3 is expected if the correlation between the leverage and the measure of earnings management is weaker among public than among private companies.

It can be seen from Panel C in Table 3 that STD[PROF/CF] does not differ significantly between public and private companies (p-value = 0.367). A lower ratio of STD[PROF/CF] indicates that a company reports a smooth income and theoretical studies suggest that companies with a high leverage have the incentive to report a smooth income (Trueman and Titman, 1988). However, the data does not give significant support to this prediction since the Spearman correlation coefficient between LEVER and STD[PROF/CF] is only -0.025 (p-value = 0.748).²¹ LEVER, as well as the interaction between LEVER and PUBLIC, is also insignificant in the OLS regression.

The final aggregate measure used also attempts to capture the level of income smoothing in the companies. A negative correlation between DCF and DACCR is a natural result of accrual accounting; however, a more negative ratio indicates that a company is using accruals in order to smooth its income stream (see Leutz et al., 2003). The association is compared using the following regression:

$$(3) \quad \text{DACCR} = \alpha + \beta_1 \text{DCF} + \beta_2 \text{DCF} * \text{PUBLIC} + \beta_3 \text{LEVER} + \beta_4 \text{DCF} * \text{Q}_4 \text{LEVER}$$

²⁰ The ratio of small profits to small losses was also calculated used the total sample with 3263 firm years for the non-public companies. The ratio was 2.25, that is, almost similar to the ratio for the public companies.

²¹ The coefficient of LEVER was -0.124 (p-value = 0.044) as the entire sample with non-public companies was used instead of the matched sample.

TABLE 3. Aggregate measures of earnings management.

Panel A - ABS[DACCR] used as the measure					
Private companies		Public companies			Correlation coefficient ¹⁾
Mean	Median	Mean	Median	T-value	LEVER and ABS[DACCR]
0.085	0.059	0.079	0.051	0.67	0.01
OLS regression²⁾: $ABS[DACCR] = \alpha + \beta_1PUBLIC + \beta_2LEVER + \beta_3LEVER*PUBLIC$					
β_1	β_2	β_3	F-value	R-squared	
-0.005 (0.21)	0.004 (0.13)	-0.001 (0.02)	0.16	0.001	

Panel B - small PROF/LOSS used as the measure					
Private companies		Public companies			Correlation coefficient ¹⁾
Small profit	Small loss	Small profit	Small loss	Pearson Chi-square	LEVER and (small) LOSS
53.3%	46.7%	73.8%	26.2%	3.237*	0.318***

Panel C - STD[PROF/CF] used as the measure					
Private companies		Public companies			Correlation coefficient ¹⁾
Mean	Median	Mean	Median	T-value	LEVER and STD[PROF/CF]
0.676	0.514	0.765	0.604	0.904	-0.025
OLS regression²⁾: $STD[PROF/CF] = \alpha + \beta_1PUBLIC + \beta_2LEVER + \beta_3LEVER*PUBLIC$					
β_1	β_2	β_3	F-value	R-squared	
-0.090 (0.31)	-0.276 (0.73)	0.368 (0.67)	0.46	0.008	

Panel D - $\rho[DCF, DACCR]$ used as the measure					
OLS regression²⁾: $DACCR = \alpha + \beta_1DCF + \beta_2DCF*PUBLIC + \beta_3LEVER + \beta_4DCF*Q_4LEVER$					
β_1	β_2	β_3	β_4	F-value	R-squared
-0.641 (20.01)***	-0.052 (1.16)	-0.005 (0.70)	-0.198 (3.72)***	258.27***	0.657

Notes:

1) Spearman rank correlation

2) T-values in parentheses

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

The number of observations is 545 in the OLS regressions in Panels A and D and 173 in Panel C

Q_4LEVER is a dummy variable taking the value one if the leverage of the company is in the top quartile of the leverage among the companies in the sample and zero otherwise. The other variables are explained in Table 1.²²

The results are reported in Panel D in Table 3. A negative and significant coefficient on β_2 would suggest that public companies report a smoother income stream. However, the coefficient of β_2 is -0.053 (p-value 0.244). Furthermore, it can be seen from the table that the interaction $DCF*Q_4LEVER$ has a negative and significant coefficient. This result suggests that highly leveraged companies are more likely to smooth their income.

6.2 Specific Accruals Items

Depreciation: Following Sundgren and Johansson (2004), the depreciation and amortization in the income statement (excluding goodwill amortization) in relation to the sum of depreciable assets among tangible and intangible assets (before the current year's depreciation) is used as the measure of the depreciation policy. A higher value of this ratio indicates that firms use more conservative depreciation policies and thus shift reported earnings from the current period to future periods. The study requires a control for other factors that affect $DEPR$. The following regression includes the variables of interest as well as control variables:

$$(4) \quad DEPR = \alpha + \beta_1PUBLIC + \beta_2LEVER + \beta_3PUBLIC*LEVER + \beta_4CFTA + \beta_5LNASSETS + \beta_6TANGIBLE + \beta_7MACHINE\&EQ + \beta_8\Delta DEPRASSETS$$

The rationales for the control variables are as follows: The useful lives of assets are likely to depend on industry factors as well as the kind of assets that the firm has. Above all, firms with more machinery and equipment are likely to depreciate their assets over a shorter period of time than firms with more buildings. Intangible assets are also typically amortized over shorter periods than tangible assets. The measures used to control for this are machines and equipment in relation to the depreciable assets ($MACHINE\&EQ$) and the intangible assets in relation to the depreciable assets (excluding goodwill) ($INTANGIBLE$).

The depreciation and amortization in relation to the depreciable assets also depends on the age structure of the assets. If a firm uses straight-line depreciation, the numerator of the dependent variable will be unaffected by the age of the assets while the denominator will be larger for firms with more newly acquired assets.²³ The change in depreciable assets during a two-year

²² A dummy variable of $LEVER$ is used instead of the continuous variable since DCF and $DCF*LEVER$ were highly correlated (Pearson correlation equal to 0.928). The results were qualitatively similar when a dummy variable taking the value one if the company's leverage was in the top percentile was used instead of the classification based on quartiles.

²³ Accumulated depreciation is not available. Thus, the purchase value of assets cannot be used as the denominator.

TABLE 4. Factors affecting depreciation in relation to the depreciable assets.

	Reg. 1	Reg.2	Reg. 3¹⁾	Reg. 4²⁾
PUBLIC	-0.018 (0.89)	0.001 (0.08)	0.003 (0.48)	0.003 (0.24)
PUBLIC* LEVER	0.036 (0.99)	-	-	-
LEVER	-0.075 (2.97) ^{***}	-0.058 (3.14) ^{***}	-0.038 (2.08) ^{**}	-0.069 (2.23) ^{**}
CFTA	-0.028 (1.20)	-0.026 (1.13)	-0.033 (1.62)	0.008 (0.19)
LNASSETS	-0.007 (2.88) ^{***}	-0.006 (2.83) ^{***}	-0.012 (5.20) ^{***}	-0.001 (0.32)
MACHINE & EQ	0.079 (6.41) ^{***}	0.080 (6.54) ^{***}	0.088 (7.73) ^{***}	0.066 (3.03) ^{***}
INTANGIBLE	0.371 (10.90) ^{***}	0.369 (10.86) ^{***}	0.251 (7.29) ^{***}	0.414 (7.08) ^{***}
Δ DEPRASSETS	-0.019 (3.62) ^{***}	-0.019 (3.66) ^{***}	-0.008 (1.77) [*]	-0.156 (3.55) ^{***}
CONSTANT	0.204 (6.82) ^{***}	0.193 (6.93) ^{***}	0.242 (8.80) ^{***}	0.129 (2.73) ^{***}
F-value	25.74 ^{***}	29.27 ^{***}	31.08 ^{***}	12.92 ^{***}
R-squared	0.2775	0.2762	0.4518	0.2544
N	545	545	272	273

Notes:

The table reports OLS regressions.

1) Sample consists of firms with Δ DEPRASSETS higher than or equal to the median value 12.42%

2) Sample consists of firms with Δ DEPRASSETS lower than the median value 12.42%

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

period (Δ DEPRASSETS) is included in the regression to control for this.²⁴ Since the dependent variable will take on smaller values for firms with more newly acquired assets, a negative coefficient is expected. LNASSETS is included to control for the remaining size differences between the sub-samples. Finally, cash flow from operations in relation to lagged assets (CFTA) is included to control for the potential effect of performance on the depreciation policy (Sundgren and Johansson, 2004).

The results are reported in Table 4. Regression one includes all variables in model (4) and in regression two the interaction between LEVER and PUBLIC is excluded. The depreciation policy has a greater effect on earnings if a company has invested a lot during the past years. In such a

²⁴ The variable had a number of very extreme values. To reduce the impact of outliers on the results, Δ DEPRASSETS was winsorized two percent in the top and bottom tails of the distribution.

case, the depreciation expense in the income statement also depends to a greater extent on depreciation schemes for assets that have been acquired by the current management team. To gather insights on whether the correlations are sensitive to the investment level, the models are also estimated on the sub-sample with companies whose growth in assets (measured with $\Delta\text{DEPRASSETS}$) is higher (lower) than the median value for the entire sample. Regression three is run on the sub-sample of companies whose growth in assets is higher or equal to the median 12.42% and regression four is run on the sub-sample of companies whose growth in assets was less than 12.42%.

The following observations can be made from the table: the coefficient of `PUBLIC` is insignificant and close to zero in all regressions. Furthermore, it can be seen that `LEVER` has negative coefficients that are significant at the 0.05 or 0.01 levels in all regressions.²⁵ Finally, the interaction between `PUBLIC` and `LEVER` in regression two shows that there are no significant differences in the association between the dependent variable and leverage between the public companies and private companies.²⁶ The finding that leverage is associated with depreciation policy corresponds with Sundgren and Johansson (2004) that also studied small and mid-sized Finnish companies. However, a difference between this study and Sundgren's and Johansson's study is that consolidated financial statements were used. Sundgren and Johansson used the separate statements for the parent company or subsidiaries if a company belonged to a corporate group.

Amortization of goodwill: The following OLS regression is estimated in order to test whether the amortization depends on whether a company is public or not and whether there is an association between the leverage and the dependent variable.

$$(5) \quad \text{AMORT} = \alpha + \beta_1 \text{PUBLIC} + \beta_2 \text{LEVER} + \beta_3 * \text{PUBLIC} * \text{LEVER} + \beta_4 \text{CFTA} + \beta_5 \text{LNASSETS} + \beta_6 \text{LNGOODWILL}$$

where `AMORT` is the amortization of goodwill in relation to the balance sheet amount before the current year's amortization and `LNGOODWILL` is the natural logarithm of the change in goodwill over a two-year period. In order to avoid taking the logarithm of a value smaller than one, two was added to the ratio before the natural logarithm was taken.

The rationales for the control variables are as follows: The amortization in relation to the balance sheet amount of goodwill depends on the age structure of the balance sheet amount. The

²⁵ The data includes more than one observation for some of the firms, which could motivate the use of a random effect or fixed effect model. The results in the regressions with respect to `PUBLIC` were qualitatively similar as a random effect model was used. Different from the results reported in Table 3 `LEVER` was insignificant in the regressions and `CFTA` was significant at the 10%-level in regressions one and two in the random effect models (not reported). `LEVER` and `PUBLIC` were also insignificant in regressions three and four.

²⁶ The regressions in Table 3 were re-run using the sample with public companies and the entire sample of 3263 firm-years for non-public firms. `PUBLIC` and `LEVER` were insignificant in these regressions (not reported).

numerator of the dependent variable will be unaffected by the age of the assets while the denominator will be larger for firms with more newly acquired assets. $LNGOODWILL$ is included in the regression in order to control for this. Furthermore, $CFTA$ is included in order to control for the possible effect of performance on amortization and $LNASSETS$ is included as a control for size.

The OLS regressions reported in Table 5 are run using the sub-sample of those 177 companies whose $AMORT$ is higher than zero. Four regressions are reported: regression one is based on the full model described above, in regression two the interaction between $LEVER$ and $PUBLIC$ is dropped, regression three is run on the sub-sample of companies whose growth in goodwill (measured with $LNGOODWILL$) is higher than or equal to the median value of the growth, and regression four is run on the sub-sample of companies whose growth is lower than the median value.

The results in Table 4 show that the coefficient of $PUBLIC$ is positive. However, it is significant at the 0.10 level only in regression three. Furthermore, $LEVER$ has a negative coefficient in the regressions. The coefficient is significantly different from zero at the 0.10 level in regression three. Finally, the interaction between $PUBLIC$ and $LEVER$ is insignificant in regression two in the table.^{27, 28}

Recognition of impairment losses: Table 6 compares the magnitude of impairment losses between the public and private companies. The control variables used are based on Cotter et al. (1998). They point out that the recognition of an impairment loss is a function of the probability of a decline in asset values and the capacity to write-down.²⁹ Cotter et al. argue that the probability of a decline in asset values is a function of the size of the business, growth options and the change in performance. $LNASSETS$, $\Delta TOTASSETS$ and DCF are used as the measures.³⁰

Cotter et al. claim that firms with a higher leverage and lower cash reserves are more likely to choose a smaller write-down due to the adverse effect on write-downs on borrowing and equity-raising prospects. $CASH$ is included in addition to $LEVER$ in order to control for this. The following regression is estimated in order to study whether $PUBLIC$ and $LEVER$ affect the recognition of impairment losses:

$$(6) \quad IMPAIR = \alpha + \beta_1 PUBLIC + \beta_2 LEVER + \beta_3 DCF + \beta_4 LNASSETS + \beta_5 CASH + \beta_6 \Delta TOTASSETS$$

²⁷ The results in the regressions were qualitatively similar as a random effect model was used.

²⁸ The regressions in Table 5 were also run using the public companies and the entire sample with 3263 firm-years for the private companies. The results with respect to $PUBLIC$ and the interaction between $PUBLIC$ and $LEVER$ were qualitatively similar to the ones reported in Table 5. However, $LEVER$ had a negative and significant coefficient in the regressions.

²⁹ In addition, they argued that the recognition of impairment losses would be more common around management changes. However, they did not find significant support for this hypothesis.

³⁰ Cotter et al. (1998) used the market-to-book ratio as the measure of growth opportunities and the change in return-on-assets instead of cash flows as the measure of the change in performance. The study of private firms makes it impossible to use the market-to-book ratio. Furthermore, the change in cash flows was used instead of the change in return-on-assets since it is, to a greater extent, a pre-managed measure of performance.

TABLE 5. Factors associated with the amortization of goodwill.

	Reg. 1¹⁾	Reg. 2¹⁾	Reg. 3²⁾	Reg. 4³⁾
PUBLIC	0.035 (0.27)	0.059 (1.44)	0.038 (1.73)*	0.010 (0.29)
PUBLIC* LEVER	0.044 (0.19)	-	-	-
LEVER	-0.072 (0.39)	-0.045 (0.38)	-0.116 (1.91)*	-0.084 (0.81)
CFTA	-0.086 (0.66)	-0.086 (0.66)	0.010 (0.15)	-0.037 (0.32)
LNASSETS	-0.038 (3.32)***	-0.038 (3.33)***	-0.009 (1.71)*	-0.008 (0.72)
LNGOODWILL	-0.083 (5.88)***	-0.083 (5.89)***	-0.017 (2.77)***	-1.309 (17.44)***
CONSTANT	0.802 (4.98)	0.786 (5.85)***	0.295 (4.66)***	1.052 (7.77)***
F-value	7.96***	9.59***	3.39***	66.69***
R-squared	0.2192	0.2191	0.1714	0.8007
N	177	177	88	89

Notes:

The table reports OLS regressions.

1) Firms with a positive AMORT are included in the sample.

2) Sample consists of firms with LNGOODWILL higher than or equal to the median value of 0.703.

3) Sample consists of firms with LNGOODWILL lower than the median value of 0.703.

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

In regressions one and two in Table 6 Tobit regressions are used. The dependent variable in these two regressions is IMPAIR that is defined as the impairment loss during the year in relation to lagged assets. In regression three IMPAIR is replaced with a dummy variable taking the value one if the company recognized an impairment loss and zero otherwise. In regression four the analyses are restricted to those 88 companies that recognized an impairment loss and OLS regressions are used to study the determinants of the magnitude of IMPAIR.

DCF is the change in cash flows from operations in relation to lagged assets, CASH is cash and marketable securities to lagged assets, Δ TOTASSETS is the change in total assets over a two-year period to lagged assets and the other variables are defined as above.³¹ The exact calculations of independent variables are explained in Table 1.

³¹ The variable had a number of very extreme values. To reduce the impact of outliers on the results, Δ TOTASSETS was winsorized two percent in the top and bottom tails of the distribution

TABLE 6. Factors associated with the recognition of an impairment loss.

	Reg. 1¹⁾	Reg. 2¹⁾	Reg. 3²⁾	Reg. 4³⁾
PUBLIC	-0.003 (0.40)	0.0004 (0.17)	0.115 (0.43)	-0.003 (1.20)
PUBLIC* LEVER	0.006 (0.50)	-	-	-
LEVER	-0.024 (2.51)**	-0.021 (2.86)***	-1.620 (2.11)**	-0.024 (2.71)***
LNASSETS	0.002 (2.90)***	0.002 (2.96)***	0.341 (4.16)***	-0.0009 (1.21)
DCF	-0.0002 (0.03)	0.0001 (0.01)	-0.113 (0.13)	0.014 (0.95)
CASH	0.005 (1.14)	0.005 (1.14)	0.682 (1.28)	-0.006 (1.00)
ΔTOTASSETS	-0.004 (1.57)	-0.004 (1.59)	-0.493 (1.81)*	0.005 (1.51)
CONSTANT	-0.032 (3.11)***	-0.034 (3.52)***	-4.822 (4.90)***	0.030 (3.36)***
Model chi-square	23.53***	23.28***	29.62***	-
F-value	-	-	-	2.85**
R-squared	-	-	-	0.1742
N	531	531	531	88

Notes:

14 firms that reported a negative impairment loss were omitted from the analyses.

1) Tobit regression. The dependent variable IMPAIR takes the value zero for 443 observations and a positive value for 88 observations.

2) Logistic regression. The dependent variable takes the value one for the 88 companies having recognized an impairment loss and zero otherwise.

3) OLS regression. Sample consists of 88 companies that recognized an impairment loss. The dependent variable in the regression is IMPAIR, calculated as impairment losses / lagged total assets.

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

The following observations can be made from the table.³² The coefficients of PUBLIC are insignificant and close to zero, suggesting that there are no differences when recognizing impairment losses between the public and private companies. Furthermore, it can be seen from the regression that LEVER has negative and significant coefficients in all four regressions.³³ The results in regressions three and four suggest that highly leverage companies are less likely to recognize

³² 14 firms that reported a negative impairment loss were omitted from the analyses. Impair took the value zero for 443 observations and a positive value for 88 observations.

an impairment loss, and furthermore, they recognize a smaller impairment loss once they recognize a loss.

6.3 Real transactions

Companies can use the timing of asset sales and the realization of other non-recurring items as a means to manage earnings (e.g., Beatty and Harris, 1999). Such gains and losses are typically recognized as a non-operating income or as an extraordinary item.

Prior studies suggest that companies smooth their income and that they avoid earnings decreases (e.g., Burgstahler and Dichev, 1997). If this were the case, one would expect a negative correlation between the change in earnings before extraordinary items and other non-recurring items and the change in the non-operating income and extraordinary income.

Change in other operating income: It is studied whether the increase in “other-operating income” is a function of the change in earnings (before extraordinary items and other operating income), whether the association is different between public and private companies and whether the association depends on the company’s leverage.

The research questions are addressed using the following regression:

$$(7) \quad \Delta \text{OTHEROP} = \alpha + \beta_1 \text{PUBLIC} + \beta_2 \Delta \text{INC} + \beta_3 \text{PUBLIC} * \Delta \text{INC} + \beta_4 Q_4 \text{LEVER} + \beta_5 Q_4 \text{LEVER} * \Delta \text{INC} + \beta_6 Q_4 \text{LEVER} * \Delta \text{INC} * \text{PUBLIC}$$

where $\Delta \text{OTHEROP}$ is the current year’s other operating income less the previous year’s other operating income scaled by lagged total assets. ΔINC is the change in net income (before the other operating income and extraordinary items) scaled by the previous year’s total assets and $Q_4 \text{LEVER}$ is a dummy variable taking the value one if the leverage of the company is in the top quartile of the leverage among the companies in the sample and zero otherwise.³⁴

The results are presented in regressions one and two in Table 7. It can be seen that ΔINC has a negative and significant coefficient, showing that companies with decreasing earnings are increasing their other operating income and vice versa. In the first research question in the paper it is asked whether public companies are more likely to manage their earnings than privately held companies. A negative coefficient on $\text{PUBLIC} * \Delta \text{INC}$ would indicate that public companies to a

³³ Also the regressions in Table 6 were re-run using the entire sample with 3263 firm-years for the non-public companies. The following observations were made: PUBLIC had a positive coefficient significant at the 0.10 level in regressions one, two and three. The coefficient is insignificant in Table 6. Furthermore, LEVER was significant at the 0.10 level in regression one and four and insignificant in regressions two and three. LEVER is significant in all four regressions in Table 6.

³⁴ The dummy variable $Q_4 \text{LEVER}$ is used instead of the continuous LEVER in order to avoid problems with multicollinearity in the regressions.

TABLE 7. Ownership, leverage and the association between the change in earnings and the change in other operating income or extraordinary income.

	Reg. 1 ¹⁾	Reg. 2 ¹⁾	Reg. 3 ²⁾	Reg. 4 ²⁾
PUBLIC	0.002 (0.55)	0.002 (0.55)	-0.0004 (0.13)	-0.0007 (0.19)
Δ INC	-0.088 (3.03) ^{***}	-0.088 (3.04) ^{***}	0.076 (1.73) [*]	0.066 (1.59)
PUBLIC* Δ INC	-0.055 (1.18)	-0.055 (1.22)	-0.003 (0.06)	0.013 (0.26)
Q ₄ LEVER	-0.002 (0.36)	-0.002 (0.36)	0.00007 (0.02)	-0.0001 (0.04)
Δ INC* Q ₄ LEVER	0.003 (0.37)	0.003 (0.37)	-0.086 (1.00)	-0.049 (0.73)
PUBLIC* Δ INC* Q ₄ LEVER	0.004 (0.04)	-	0.093 (0.68)	-
CONSTANT	0.004 (1.71) [*]	0.004 (1.71) [*]	-0.0005 (0.18)	-0.0003 (0.12)
F-value	4.68 ^{***}	5.62 ^{***}	1.27	1.43
R-squared	0.0501	0.0501	0.0141	0.0133
N	539	539	539	539

Notes:

The table reports OLS regressions.

1) The dependent variable is Δ OTHEROP. Six observations with a Cook's distance higher than 0.09 were omitted from the analyses. The main difference between the reported results and results based on all observations is that the coefficient (t-value) of PUBLIC* Δ INC was -0.193 (3.55) in regression one and -0.220 (4.03) in regression two. The exclusion of cases with extreme residuals has a similar effect on the results as the omission of the cases with high Cook's distances.

2) The dependent variable is Δ EXTINT. Six observations with a Cook's distance higher than 0.10 were omitted from the analyses. The main difference between the reported results and the results based on all observations is that Δ INC has a positive and significant coefficient. The coefficient (t-value) is 0.220 (3.90) in regression three and 0.176 (3.31) in regression four. The exclusion of cases with extreme residuals has a similar effect on the results as the exclusion of cases with high Cook's distances.

* Significant at the 10 percent level (two tailed test)

** Significant at the 5 percent level (two tailed test)

*** Significant at the 1 percent level (two tailed test)

larger extent are timing asset sales, and that they in other ways are increasing their other operating incomes, as they experience an earnings decline. The coefficient of the interaction is negative; however, not significantly different from zero.^{35, 36} It can also be seen from the Table that the coefficients of Δ INC* Q₄LEVER is small and insignificant.³⁷

³⁵ Six observations with high Cook's distances were excluded from the sample. The coefficient of PUBLIC * Δ INC was negative and significant before the omission of these observations.

³⁶ The results in Table 7 were also re-run using the entire sample with 3263 non-public companies. The interaction between public had a negative and insignificant coefficient in some regressions, albeit the results were sensitive to the treatment of companies with extremely high residuals and Cook's distances.

³⁷ This result is robust to the specification of the dummy used to identify companies with a high leverage. The results

All in all, the results show that companies with decreasing earnings report increases in other operating income. However, there are no significant differences in the correlations between public and private companies or between companies with a high and a low leverage.

Extraordinary income: $\Delta\text{OTHEROP}$ is replaced with ΔEXTINT (calculated as the change in extraordinary income scaled by lagged assets) in model (7) above in order to study the correlations between the change in the extraordinary income and the change in earnings. These results are reported in columns three and four in Table 7. The variables of interest are $\text{PUBLIC}*\Delta\text{INC}$, $\Delta\text{INC}*Q_4\text{LEVER}$ and $\Delta\text{INC}*Q_4\text{LEVER}*\text{PUBLIC}$. The coefficients of all three interactions are insignificant, however.

7. CONCLUSIONS

The paper studies earnings management in public and private companies and whether earnings management is a function of a company's leverage using a matched sample with 99 public and 99 private Finnish companies. The data covers the period 1997–2001 and consists of 545 firm-years.

Prior studies suggest that the incentive to manage earnings varies between public and non-public companies. However, the findings are mixed in the sense that some suggest that public companies report higher quality earnings (e.g., Ball and Shivakumar, 2005; Burgstahler et al., 2005) while others suggest that public companies are more likely to manage their earnings (e.g., Beatty and Harris, 1999; Beatty et al., 2002).

Three types of earnings management measures are used in the paper. Firstly, the following "aggregate measures" of earnings management are used - discretionary accruals using the DeAngelo model, the ratio of small profits to small losses, the variation in earnings in relation to the variation in cash flows and the correlation between the change in accruals and the change in cash flows. There are no significant differences between the public and the private companies were found in these measures.

Secondly, the following specific accrual items are studied: the depreciation policy, the amortization of goodwill and the recognition of impairment losses. As above, there are no significant differences in the measures between the public companies and the private companies. Parts of these results suggest a positive association between leverage and the use of income increasing accounting methods. For example, the regressions reported in Table 6 show that highly leveraged companies recognize smaller impairment losses. This corresponds with prior studies (e.g., Sundgren and Johansson, 2004; Holthausen and Leftwich, 1983).

were qualitatively similar as $Q_4\text{LEVER}$ was replaced with a dummy variable taking the value one if the company's leverage was in the top percentile among the companies in the sample and zero otherwise.

Thirdly, it is studied whether companies use the timing of asset sales and other gains reported as a non-operating income or an extraordinary item as a way to manage earnings. A negative and significant correlation is found between the change in non-operating income between two years and the change in earnings before the non-operating income and extraordinary items. This result suggests that companies use the timing of asset sales and the realization of other non-recurring items as a means to report a smooth income stream. However, no significant differences in the tendency to do so are found between the public and the private companies.

In common with other studies comparing private and public companies, one drawback of this study is that neither public companies nor private companies are homogeneous groups. Public companies differ with respect to management ownership, ownership concentration and the likelihood that the company becomes a target for a hostile takeover, whereas private companies differ with respect to the likelihood that they will go public in the future. These factors may have an impact on accounting choices. Consequently, observed differences between public and private companies might depend on such characteristics of firms in the sample. ■

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APPENDIX: Companies in the sample

Public companies	Non-public companies	Public companies	Non-public companies
Alma Media	TS-Yhtymä	Novo	SOL Palvelut
Amer	Onninen	Olvi	Polttimo Yhtiöt
Atria	Artekno/Saarioinen	Orion	Kiilto Oy
Basware	Opus Capita	Panostaja	Putkola Oy
Benefon	Laukamo Teollisuus	PKC-Group	Helvar Merca
Biohit	Fimet	Planmeca /plandent	Finntemet
Birka line	Container Finance	PMJ-Automec	Suomen koneliike
Chips	Snellman	Poar kiinteistöt	Lujatalo
Componenta	Teknos group	Pohjois karjalan kirjapaino	A-Lehdet
Efore	Kumera Oy	Ponsse	Halton Group
Eimo	Rani plast	Proha	Salomaa Yhtiot
Elcoteq	Jutron	Raisio	Fazer
Elecster	Veisto	Rakentajain konevuokraamo	Engel
Elisa	PHP-Holding	Rapala	Närko
Endero	Tietonovo	Rautaruukki	Stafi Oy
Espoon Sähkö	Etelä pohjanmaan voima	Raute	Maaseudun kone
Etteplan	Contineo	Rocla	Hollming
Finnair	Metsäpietilä	Sanitec	Kuusakoski
Finnlines	Eckerö	Silja Line	Ångfarts Alfa
Finvest	Paloheimo	Solteq	Helsoft
Fortum	Savon Voima	Sonera	Vaasan läänin puhelin
Hartwall	Ingman	Soon Communication	Oulun puhelin
HK	Pouttu	Sponda	Arkta Oy
Honkarakenne	Vierumäen Teollisuus	Stockmann	Wiklöf Holding
Ilkka	Kaleva Kustannus	Stonesoft	Samlink
Incap	Loipart	Stora Enso	Kuhmo
Interavanti	Pertti Kuismanen invest	Stromsdal	PRT-Forest
Iocore	Nethawk Oy	Suomen Helasto	Kokkolan Halpahalli
Janton	Otava-Kuvalehdet	Sysopen	Sofor
Jippii group	Kymen puhelin	Talentum	Länsi Savo
JOT-Automation	Licencia (Kemppi)	Tallberg	Oy Realinvest
Kasola	Eriksson Capital	Tamfelt	Sievi marketing
KCI-Konecranes	TM Fridge (Huurre)	Tamro	Veikko Laine
Kemira	KWH	Technipolis	OWH-Yhtiöt
Keskisuomalainen	Garamond (Gummerus)	Tekla	Teemu Aho
Kesko	Wihuri	Teleste	Urho Tuominen
Kone	Hyvinkään metalli	Tervakosken puuhamaa	Lindström
Kontram	Thombrokers /Thomesto	Tietoenator	Instrumentointi Oy
Kylpyläkasino	Sirkan Tahti	TJ-Group	Setec
Kyrö	Koskitukki	Tulikivi	OI Finnish holdings
Larox	Sarlin	Turkistuottajat	Oy Lunden
Lemminkäinen	Hartela	Turun Arvokiinteistöt	Suomen kiinteistokehitys
Leo Longlife	Helkama Bica	UPM-Kymmene	Ahlstrom
Lännen Tehtaat	Paulig	Vaahto group	Purso
Marimekko	L-Fashion	Vaisala	Polar electro
Martela	Sohlberg	Wecan electronics	Metorex International
Metsaliitto	Harjavalta (Kastelli)	Viking Line	Palcmills
Nordic Aluminium	Kojo yhtiöt	Wärtsilä	Lillbacka
Norvestia	EKE-Finance	YIT-Yhtymä	SRV Yhtiöt
		Yleiselektronikka	Isku