Managing Earnings with Intercorporate Investments*

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Abstract

We explore to what extent firms deliberately manage their financial reports by exploiting the flexibility of generally accepted accounting principles. Using a sample of Oslo Stock Exchange-listed firms with 20–50% equity holdings in other firms, we find that firms with high financial leverage tend to maximize reported earnings from these investments through their choice between the cost method and the equity method, possibly in an attempt to reduce debt renegotiation costs or to avoid regulatory attention. In contrast, managers do not systematically bias reported earnings to extract private benefits or to signal revised expectations about future cash flows. Firms use different earnings management tools in a consistent way, as the earnings effect of the cost/equity choice is not offset by discretionary accruals.

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Key Words: earnings management, cost method, equity method, associated firms, discretionary accruals.

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1 Introduction

This paper explores to what extent a firm's choice between the cost method and the equity method for associated firms is driven by incentives to manipulate earnings. We do this by studying whether managers choose between these two methods in order to extract private benefits or to signal insider information to outsiders.

Our approach adds to the general literature on earnings management (see e.g. Holthausen and Leftwich, 1983; Fields et al., 2001; Yoon and Miller, 2002) by ameliorating two methodological problems. First, we avoid the classic joint hypothesis problem of discretionary accruals models (Bernard and Skinner, 1996) because we can directly observe the accounting policy choice and compute its earnings impact from well defined accounting relationships. Second, we do not consider just one accounting method choice in islolation (see e.g. Jennings et al., 1996), but instead control for potential offsetting earnings effects across a portfolio of accounting method choices (DeAngelo, 1988). We implement this idea by considering the firm's reporting for both intercorporate investments and discretionary accruals.

The specific earnings management tool we study has been analyzed by Mazay et al. (1993), Zimmer (1994), and Morris and Gordon (2004), who explore the cost/equity choice in Australian firms. The regulatory environment of their sample firms resembles that of the Norwegian firms in our sample. Although the actual rules are quite different, both systems have generated extensive non-compliance.[1] This feature creates a particularly interesting setting for analyzing earnings management.

Despite this similarity, our study is different in several ways. First, Mazay et al. (1993), Zimmer (1994), and Morris and Gordon (2004) ignore the information asymmetry rationale

[1]The Australian regulatory regime is specified by AAS14 and ASRB1016, which were valid for the period 1984-1997. Whereas the Norwegian system prescribes the equity method for associated firms, Australia mandates the cost method in the primary statement and footnoted comparative figures based on the equity method. Details can be found in Morris and Gordon (2004).

and explain the accounting method choice in terms of efficient contracting and opportunistic behavior (the three perspectives are discussed in Holthausen, 1990). In contrast, we ignore efficient contracting and focus instead on opportunistic behavior and information asymmetry.[2] Second, Mazay et al. (1993), Zimmer (1994) and Morris and Gordon (2004) use the cost/equity decision as the dependent variable in their models. While this approach is well suited to analyze the incentives to minimize expected contracting costs *ex ante*, it is less suited for analyzing the incentives to create agency costs *ex post*. Exploiting instead the fact that the decision to increase or decrease earnings is embedded in the cost/equity choice, we use the earnings effect of the accounting method choice as the dependent variable. This approach allows for a more direct test of the *ex post* incentives.

The empirical evidence on the cost/equity choice in Australia is somewhat conflicting. The results in Mazay et al. (1993) support contracting efficiency but not opportunistic behavior, Zimmer (1994) finds support for both, whereas the evidence in Morris and Gordon (2004) is consistent with opportunistic behavior, but not with efficient contracting. This pattern suggests that we may improve our overall understanding of how earnings management incentives drive the accounting method choice by analyzing a similar institutional regime with a more comprehensive methodological battery.

Corporate law and Generally Accepted Accounting Principles (GAAP) in Norway *recommend* that firms consolidate an intercorporate investment whenever it satsfies all of the following conditions: (i) is between 20 and 50%, (ii) gives the investor significant influence over the investee, and (iii) is considered long-term and strategic.[3] The equity method is mandatory if

[2]Unlike the opportunistic behavior and the information asymmetry perspective, the efficient contracting rationale does not ask if the investors manipulate accounting statements in order to maximize or minimize reported earnings, but what method they choose in order to minimize expected contracting costs. For instance, studying intercorporate investment above 50% in Australia, Main and Smith (1990) find that the investor monitors the investee by using full consolidation more often the stronger the operational, informational, and financial interdependence between the two. Similarly, Whittred (1987) and Whittred and Zimmer (1994) conclude that fully consolidated accounts are used by Australian firms to minimize funding costs when the investee borrows from the investor or with the investor's guarantee.

[3]As will the clear below, this is not a recommendation for full consolidation, which is mandatory when

the investor chooses to consolidate, while the cost method is mandatory if no consolidation is made.

This regulatory environment differs from North American and E.U. countries, where the equity method is mandatory once the investment is in the 20–50% range. In contrast, the Norwegian GAAP (NGAAP) rule that the decision to use the equity method rather than the non-consolidating cost method is left to management's discretion. Bøhren et al. (2004) find that the financial reporting practice of Norwegian firms is inconsistent with this flexible regime. Neither the relative voting power of the investor (significant influence), the length of the investment period (long-term commitment), nor the investment's size or recent growth (strategic importance) influences the choice between the cost and equity methods. Since the consolidation decision is not driven by a desire to comply with the GAAP, the natural question to ask is whether firms instead utilize the flexibility of the accounting standard for earnings management purposes. Our paper tries to answer that question, and to determine whether earnings management is used in the best interest of the firm's owners or for the private benefit of its managers.[4]

The cost/equity choice has no direct cash flow effect. The investor and the investee are separate judicial entities, and tax payments are unaffected because they are based on the firms' individual financial statements. Still, the reporting method influences the investor's accounting figures. Earnings and the book value of equity change by the received dividend under the cost method, while under the equity method the change equals the investor's proportional share of the investee's earnings. Compared to the cost method, the equity method increases earnings and equity whenever the investee's profit is sufficiently large relative to its dividends, and vice versa. Managers of the investor can therefore use the consolidation

the holding is at least 50%. Rather, it involves a more limited aggregation which is sometimes called mini consolidation or one-line consolidation. We use the term consolidation for this limited system.

[4]A more profound issue that we do not address is the welfare implications of earnings management. For instance, a bank may benefit its owners by managing earnings to avoid minimum capital requirements. In turn, this may inflict an externality on society at large if the bank thereby increases the risk of distress in the finance sector.

choice to distort reported earnings and equity capital.

With no direct cash flow effects, the choice of accounting policy is irrelevant for firm valuation in perfect markets. Relaxing these assumptions, the efficient contracting, opportunistic behavior, and information asymmetry explanations have been used to rationalize the economic effects of accounting policy choice. The efficient contracting hypothesis predicts that managers maximize firm value by choosing accounting methods that minimize contracting costs (Watts, 1977). This behavior may not be observed under the opportunistic behavior perspective, where conflicts of interest may exist between managers, owners, and creditors (Watts and Zimmerman, 1978). Managers may for instance choose accounting methods that benefit the firm's owners, by effectively reducing creditors' claim on the firm. Finally, the information asymmetry approach assumes a compensation mechanism that induces managers to use earnings management to credibly reveal their private information (Holthausen and Leftwich, 1983; Holthausen, 1990). As with efficient contracting, but unlike opportunistic behavior, managers are assumed to maximize firm value. In all three cases, the accounting choice may matter for stakeholder welfare.

We use both opportunistic behavior and information asymmetry theories to predict why some firms choose to account for investees by the equity method rather than the cost method. We find that managers' discretion over firms' financial reporting is not used for their own personal benefit or to signal private information to the capital markets. However, highly levered firms in general, and financials in particular, tend to maximize earnings by their consolidation choice. This result is consistent with an opportunistic behavior argument that firms reduce agency costs by avoiding debt renegotiations (owner-creditor conflict) or by trying to stay away from regulatory attention (owner-regulator conflict). We do not find evidence of offsetting earnings management activity. In fact, discretionary accruals are significantly positive for firms that consistently maximize earnings with their consolidation decision, and insignificantly different from zero for consistent earnings minimizers. Compared

to existing evidence on the same accounting method choice under a similar regulatory regime, our findings are consistent with Morris and Gordon (2004), but not with Mazay et al. (1993).

Section 2 presents the theories of accounting choice and specifies our predictions. Section 3 introduces the methodology, while Section 4 discusses data selection and descriptive statistics. Section 5 analyzes the findings from the statistical tests, and Section 6 concludes.

2 Theories of accounting policy choice

We define *earnings maximizers* (*minimizers*) as firms that choose accounting principles that maximize (minimize) reported earnings. Although the cost/equity choice is only one of many tools that may serve this earnings management purpose, we ignore other options until Section 5. Table 1 summarizes our hypotheses about the determinants of earnings management and lists the proxies we will establish in Section 3 to operationalize the theoretical constructs. We next justify each hypothesis.

[Table 1 about here.]

2.1 Opportunistic behavior

The opportunistic behavior theory assumes that explicit as well as implicit contracts are based on accounting variables. We focus on contracts-based opportunistic behavior driven by owner-manager conflicts, owner-creditor conflicts, and owner-regulator conflicts, respectively.

Studies of *owner-manager conflicts* show that non-owner managers are more inclined to use earnings-increasing accounting principles than managers with large ownership stakes (Dhaliwal et al., 1982). Thus, accounting-based incentive contracts may induce opportunistic

managers to maximize reported earnings to obtain private benefits. Our first hypothesis (*H1*), which is based on the principal-agent model of Jensen and Meckling (1976), states that firms are more likely to maximize earnings the lower their ownership concentration (weak outside monitoring) and the smaller their insider holdings (weak inside incentives).

According to Jensen and Meckling (1976), managers who serve their owners may make decisions that transfer wealth to owners at the creditors' expense. Realizing this possibility of *owner-creditor conflicts*, creditors may protect themselves ex ante by demanding covenants which specify upper bounds on financial leverage or lower bounds on interest coverage. Such restrictions may drive the consolidation choice ex post, since it affects the investor's reported earnings and capital structure. Because earnings maximization reduces the risk of a costly debt covenant violation, firms may be more likely to maximize reported earnings the higher their leverage (*H2*), and the lower their interest coverage ratio (*H3*).

Owner-regulator conflicts is the third type of opportunistic behavior explored in this paper. Consider first minimum equity financing restrictions for financials set by regulators. Because violating such bounds is costly, we predict that earnings maximizing financials are closer to their minimum capital requirements than earnings minimizing financials (*H4*).[5]

Political costs represent a second dimension of the owner-regulator conflict. In our setting, favorable accounting figures may be particularly costly for large and politically visible firms (Watts and Zimmerman, 1978; Holthausen and Leftwich, 1983). For instance, stricter tax rules or tougher anti-trust legislation may be a regulatory response to abnormal profits. Thus, large firms may be more inclined than small firms to reduce political costs by choosing earnings decreasing accounting methods.

[5]As the probability of violating capital requirements may be increasing in leverage and decreasing in the interest coverage ratio, this hypothesis is related to our earlier predictions based on the owner-creditor conflict (*H2* and *H3*). Thus, even if conflicts of interest between investors and creditors were unimportant for financials, the regulatory environment may nevertheless make their consolidation behavior consistent with a covenant-based explanation. In order to capture this alternative explanation for a sub-category of firms, we keep *H4* as a separate hypothesis.

Financial firms may be different in this respect because regulators are concerned with capital requirements in general (*H4*), and with avoiding negative macroeconomic externalities caused by distress in large banks in particular. Financial firms may therefore differ from other firms when size is used to proxy for political visibility, as their total political costs may decrease rather than increase with higher earnings. We predict that non-financials are more likely to maximize earnings the smaller they are (*H5*), whereas financials are more likely to maximize earnings the larger they are (*H6*).

Although firm size is often used to measure political visibility, no association has been found between the two except in very large petroleum firms (Christie, 1990, Table 1). Also, size may reflect firm characteristics which are unrelated to political costs, such as competitive advantage, information production costs, and managerial talent (Ball and Foster, 1982). Therefore, a sharper proxy of political visibility may be required, such as taxes. At least in the stakeholder-oriented Scandinavian countries, paying unusually low taxes may hurt a firm's social reputation, forcing politically visible firms to have higher effective tax rates than others (Gupta, 1995). Our prediction is therefore that firms are more likely to maximize earnings the lower their effective tax rate (*H7*).

2.2 Asymmetric information

Voluntary accounting method choice may serve as a valuable signal, provided signaling costs and firm quality are inversely related. That is, if signaling is less costly the more promising the future cash flow, high-quality firms can afford more expensive signals. Investors acknowledging this disciplining mechanism bid up the price of firms sending expensive signals and pay less for firms with inexpensive signals.

Suppose the debt covenant is related to the investor firm's financial leverage, that its manager

has positive information about its future profitability which is unknown to the market, and that the investee's earnings are negative. Asymmetric information theory has shown that the manager may increase the stock price in this situation by minimizing reported earnings and thereby deliberately violating the debt covenant. This is achieved by choosing the equity method to account for the investee, as this reduces the investor's earnings and increases its leverage compared to the cost method. Thus, the manager's private information about undervaluation is credibly transferred to the market by voluntarily imposing higher financing costs on the firm. This signal is interpreted as positive news by the market, and the share price will be bid up.[6] Consequently our information asymmetry hypothesis states that firms are more likely to maximize earnings the lower their quality (*H8*), as low quality firms cannot afford to send high quality signals by violating debt covenants.

2.3 Industry-specific accounting practice

Watts and Zimmerman (1986) argue that the accounting method choice may be partly explained by industry characteristics. Such behavior may be driven by traditions that relate neither to accounting regulations nor to earnings management incentives. When testing the earnings management hypotheses, we control for this possibility by hypothesizing that the set of accepted accounting principles for intercorporate investments varies systematically across industries (*H9*).

[6]The existence of separating equilibria can easily be shown, where high (low) quality firms choose the earnings minimizing (maximizing) accounting policy. The proof, which is available upon request, generalizes existing results from the dichotomous LIFO/FIFO case (Hughes et al., 1994).

3 Methodology

According to Norwegian accounting principles, the equity method is based on the investee's adjusted net income, *ANI*, which is net income less intercorporate transactions and write-offs of net excess value (intrinsic value − book value) and goodwill (intrinsic value − historic cost). Under the equity method, the earnings effect on investor i's earnings from accounting for investee j at time t is $EM_{ijt} = ANI_{jt}\,\gamma_{ijt}$, where γ_{ijt} is the fraction of shares owned. We set write-offs on net excess value and goodwill to zero due to missing data, and approximate intercorporate transactions between the two firms by the intercorporate dividend $DIV_{jt}\gamma_{ijt}$. Since the impact on investor i's earnings under the cost method is $CM_{ijt} = DIV_{jt}\gamma_{ijt}$, the effect of using the equity method rather than the cost method is $\Delta EC_{ijt} = \gamma_{ijt}\,(NI_{jt} - 2DIV_{jt})$, where NI_{jt} is the investee's net income.[7] Based on ΔEC_{ijt}, we define four state-dependent consolidation decisions:

$$CHO_{ijt} \equiv \begin{cases} 0 & \text{if } i \text{ consolidates } j \text{ when } \Delta EC_{ijt} > 0 \\ 1 & \text{if } i \text{ consolidates } j \text{ when } \Delta EC_{ijt} \leq 0 \\ 2 & \text{if } i \text{ does not consolidate } j \text{ when } \Delta EC_{ijt} \leq 0 \\ 3 & \text{if } i \text{ does not consolidate } j \text{ when } \Delta EC_{ijt} > 0 \end{cases}$$

An *earnings maximizer* is defined as $CHO_{ijt} \in \{0, 2\} \equiv E_0$. Such firms make consolidation decisions that produce the largest possible reported earnings. The opposite is true for an *earnings minimizer*, where $CHO_{ijt} \in \{1, 3\} \equiv E_1$.

Based on the hypotheses summarized in Table 1, we explore whether earnings management motivates accounting choice by estimating the following model, where $\Pr(CHO_{ijt} \in E)$ is

[7] Since we use dividends as to proxy for intercorporate transactions, $EM_{ijt} = ANI_{jt}\,\gamma_{ijt} = (NI_{jt} - DIV_{jt})\gamma_{ijt}$, which means $\Delta EC_{ijt} \equiv EM_{ijt} - CM_{ijt} = (NI_{jt} - DIV_{jt})\gamma_{ijt} - DIV_{jt}\gamma_{ijt}$.

the probability that investor i applies consolidation choice E to investee j at time t:

$$\Pr(CHO_{ijt} \in E) = f(\beta_0 + \beta_1 INS_{it} + \beta_2 CON_{it} + \beta_3 LEV_{it} + \beta_4 CCR_{it} + INT_{it} + \beta_6 SIZ_{it} + \beta_7 SIZ_{it} IND_i^4 + \beta_8 TAX_{it} + \beta_9 PER_{it} + \boldsymbol{\beta}_{10-13}^{\top} \mathbf{IND}_i + \varepsilon_{it}), \quad E = E_0, E_1 \quad (1)$$

The variables in equation (1) are defined as follows:

INSiders and *CONcentration* (H1). We use the fraction of equity held by insiders (directors and officers), *INS*, to proxy for management's incentives to maximize share prices. Monitoring incentives are measured by the fraction held by the three largest investors, *CON*.

LEVerage (H2). Because Duke and Hunt III (1990) and Press (1990) find that a firm's capital structure proxies for the closeness to binding debt covenants, we use the leverage ratio (debt to total capital) based on market value to capture covenant-related costs.[8]

INTerest coverage (H3). *INT* is set equal to earnings before consolidation divided by interest expenses. The measure is independent of the consolidation choice, since we want to test whether the consolidation decision is influenced by a desire to boost *INT*.

Closeness to Capital Requirements (H4). We compute *CCR* as the excess coverage in financials relative to the minimum requirement, which was 6.5 percent prior to 1991 and 8 percent thereafter. Thus, *CCR* would be 0.25 for a firm with 10 percent capital coverage in 1993.

SIZe (H5, H6). The most common size–related proxies for political visibility are sales and asset value. Because market based asset values also reflect market risk (Berk, 1995), such size measures implicitly test a joint hypothesis that both size and market risk proxy for political visibility. This is why we choose real sales revenue rather than assets to proxy for

[8]The market value of debt is measured by its book value. The resulting bias will be modest because two thirds of Norwegian firms' debt is short-term (Bøhren et al., 1996) or with a renegotiation option for the coupon.

size.

TAXes (H7). The effective tax rate is an alternative proxy for political visibility. *TAX* is measured as the ratio of tax expenses to earnings before taxes and consolidations. Like for *INT*, this definition is independent of the actual consolidation decision.

PERformance (H8). The accounting choice we study in this paper may reduce the reliability of current earnings and book value of assets as proxies for future quality. This suggests that cash flow is superior to earnings, since the former is less distorted by earnings management. Still, Dechow (1994) finds that future performance is more closely associated with current earnings than current cash flow.[9] Since no conclusive research has yet evaluated how well different proxies reflect future performance, we use a modified version of the measure suggested by Patel et al. (1993) that hopefully strikes a reasonable balance between the different concerns. *PER* is defined as operating cash flow after taxes divided by the firm's market value, which we normalize by subtracting the average *PER* of the firm's industry.

INDustry (H6, H9). The ISIC standard is used to classify firms according to their core business. When a firm operates in several industries, we select the one in which the largest number of the group's affiliates are operating. We classify according to the first digit, as finer partitions are impeded by the sample size. The industry proxy IND_i^n is 1 if firm i is in industry n and 0 otherwise, where the industries are (index value in parentheses): petroleum drilling and production (0), manufacturing (1), shipping (2), real estate (3), finance (4), and insurance (5). The index refers to superscripts of *IND* in equation (1), such that IND_i^4 is the financials dummy and $\mathbf{IND}_i$ is the vector of all six industry dummies. Correspondingly, $\boldsymbol{\beta}_{10-13}^{\top}$ is the transpose of the vector of industry coefficients.[10]

[9] We cannot use more direct proxies, such as stock market returns. Whereas this reflects how investors *respond* to accounting signals, we study how managers use the signal to *influence* the market price. Thus, if managers of undervalued firms use earnings minimization to signal quality, we should not use a measure of private information that includes the signal's revaluation effect. We need a proxy for the propensity to *send* a signal, not its impact.

[10] The sample contains only one real estate firm (industry 3) and four insurance firms (industry 5). We

4 Sample selection and descriptive statistics

The sample is based on intercorporate equity holdings where both the investor and the investee are listed on the Oslo Stock Exchange (OSE) during the years 1984–1994.[11] The equity fraction γ_{ijt} must be in the range $[0.19, 0.50)$ regardless of the firm's choice between the equity and cost methods. Because corporate law states that investments below 50% can only be accounted for by the equity method if the firm has already fully consolidated another investment, the investor must also have at least one investment of 50% or more to be included in our sample. We set the lower bound on γ_{ijt} at 19% because one firm in our sample consolidates a fraction that is marginally below 20% (0.1999) in two consecutive years.[12] The resulting sample contains 214 investments. As 25 of the firms were delisted during the sample period, we cannot compute the forward-looking quality variable *PER* for these firms in their final listing year. Similarly, no *PER* is estimated in 1994, which is our last sample year. This leaves us with a sample of 179 investments in any setting where *PER* is required and the entire sample of 214 investments otherwise. The data were collected by hand from annual reports and from the electronic database of AS Oslo Børs Informasjon.

Before presenting descriptive statistics on the hypothesized determinants of the cost/equity choice, we quantify the potential impact of the choice on the investor's earnings. Table 2 shows the relative effect on earnings before taxes if all investments were accounted for by the

use $IND^{3,5}$ as a joint category for these two industries. Our regressions use petroleum firms (industry index 0) as the base-line case.

[11] Although the market capitalization of the OSE tripled over the sample period, it is still small by international standards. The OSE ranks 12th among the 17 European countries for which comparable data is available in 1994 (Federation Internationale des Bourses de Valeurs, 1995).

[12] 11% of the sample are investments between 19 and 20%. Although the 19% lower limit may bias the sample towards too many users of the cost method with no option to alternatively consolidate, it represents our compromise between the desire to include all potential consolidators and the need to minimize the bias towards investments with no consolidation option. Because the GAAP do not preclude switching between the two methods over time, we also include a 19–50% investment in any given year independently of the method used to account for the stake in previous years. Thus, we cannot for instance assume that once the investor has started using the equity method, it has killed the option to stop consolidating and instead choose the cost method in the future. In fact, there are two cases in our sample where the investor switches from the equity method to the cost method, subsequently moving the stake below the 19% limit.

equity method rather than the cost method. We report the absolute value of this earnings impact ratio and its characteristics for all intercorporate investments, and also separately for maximizers and minimizers.

[Table 2 about here.]

The overall earnings that may be consolidated (Panel C) is on average 31% of investors' total earnings, is larger for earnings maximizers (38%) than for minimizers (24%), and varies considerably across industries (Panel A) and years (Panel B). For instance, the average earnings impact ratio is 8% in petroleum and 71% in shipping, is 5% in 1987 and 133% in 1992. However, the average ratio for maximizers and minimizers does not differ between industries at conventional levels of significance, and the difference is only significant (p=4%) in one year if industry is ignored. This heterogeneity also shows up as a high standard deviation in the unconditional frequency distribution (Panel C). The low medians relative to means reveal that the distribution is skewed towards small impact ratios.

Consider next the actual use of the two accounting methods. Column three of Panel A in Table 3 shows that one third of the firms choose the equity method and that there is a shift towards using this method in 1990. Since the table shows no similar non-stationarity in the time series of maximizers and minimizers, however, the increased use of the equity method from 1990 is not accompanied by a higher propensity to manage earnings in a particular direction.

[Table 3 about here.]

The remaining columns of Panel A classify the consolidation choice according to its earnings effect. The means at the bottom of the panel show no clear aggregate tendency towards using the consolidation choice to manage earnings. The maximizers/minimizers split is 52%/48%. This may suggest that firms do not manage earnings, and that the consolidation choice is

driven by GAAP or by chance. Alternatively, earnings management does indeed attract managerial attention, but no significant effect is observed because incentives for earnings minimization are on average as strong as those for earnings maximization. The finding by Bøhren et al. (2004) that these firms do not comply with accounting regulations on the consolidation choice does not support the GAAP explanation. Moreover, Panel B of Table 3 shows that accounting practice varies substantially across industries. The equity method is widespread in manufacturing, while it is rarely used in real estate, finance, and insurance. Moreover, shipping firms tend to minimize earnings, while finance and petroleum firms are typical earnings maximizers.

This pattern suggests that we should look more closely at the hypothesized determinants of earnings management discussed in Section 2. Table 4 reports descriptive statistics on the investor-specific properties that pertain to all industries. Although we cannot make valid inferences about multivariate relationships from pairwise differences between means, they may provide a rough feeling for the empirical validity of our hypotheses. Table 4 documents that earnings maximizing firms have larger external and internal owners than earnings minimizers, which is inconsistent with hypothesis H1. They also have higher leverage, interest coverage, and capital coverage, which is consistent with H2, inconsistent with H3, and inconsistent with H4, respectively. Both average size and average performance are similar in the two subsamples, while earnings maximizers have lower effective tax rates, as hypothesized by H7. However, most of these differences are not statistically significant according to the p-values at the bottom of the table. This may suggest that the discretion offered by the flexible GAAP is not widely used to manage earnings. We address this question more systematically in the next section.

[Table 4 about here.]

5 Estimation and hypothesis testing

We first test the theoretical earnings management model (1), which we refer to as the base-case model. Subsequently, we explore the robustness of the base-case findings by analyzing whether an investor manages earnings consistently, both across investments in a given year and across different earnings management tools. Motivated by our base-case finding that leverage is a significant determinant of consolidation choice, we finally investigate the earnings management behavior of highly levered firms in more detail.

To estimate (1), we assume a dichotomous logit relationship and estimate the probability that firm i chooses an earnings maximizing consolidation policy for investee j at time t, given the independent variables from Section 3. To capture the shift in the use of the equity method in 1990 reported in Table 3, we add the dummy variable $S(t)$, which equals 1 when $t \geq 1990$ and 0 otherwise. We also control for the fact that financial firms have higher leverage than others. For instance, average LEV is 89% in financials and 58% in manufacturing. To remove this bias when testing the debt-related hypotheses H2 and H3, we normalize LEV and INT by the respective arithmetic means in the firm's industry, producing normalized variables LEV^n and INT^n. Due to nonoverlapping missing observations for several regressors, the estimation is based on a subsample of 118 observations.

To avoid multicollinearity problems caused by correlated industry dummies and low variation in size across financials, we estimate (1) using an industry dummy only for financials (IND^4) and measure a financial's size relative to the finance industry mean (SIZ^n).[13] The results are reported in Table 5. Because the condition number (Greene, 1993) still indicates multicollinearity, we investigate the effect of removing insignificant regressors from (1) one by one. The reduced models remain structurally stable, and their condition numbers are suf-

[13]Because industries with few firms have an industry dummy of zero for most observations in our sample, there will be high correlation between the industry dummies. IND^4 and $SIZ \times IND^4$ are strongly correlated due to low variation in SIZ across financials.

ficiently small to rule out multicollinearity effects on the estimated coefficients and p-values in table 5.

[Table 5 about here.]

Panel A of Table 5 compares the log likelihood of the estimated model to a restricted model that fits only the intercept term β_0. That is, the coefficients $\beta_1, \ldots, \beta_{10}$ are set to zero while β_0 is allowed to take on any value. This restricted model assigns every firm the same probability of being a maximizer. It also determines β_0 such that the probability that any given firm is a maximizer equals the fraction of maximizers in the sample. According to the χ^2 statistic, the fully specified model is superior to the restricted model at the 1% level.

Panel B specifies the predicted signs of the estimated coefficients, the maximum likelihood estimates, the likelihood ratios, and the p-values. The overall impression is that the sign of several estimates differ from their predictions, and that most relationships are statistically insignificant at conventional levels. In the following, we only consider estimates with a p-value below 5%.

The estimated relationship between insider holdings (INS) and earnings maximization is positive. This finding is the opposite of what would be expected if a conflict of interest existed between managers and owners, where only managers with modest equity stakes maximize earnings in order to extract private benefits at other stakeholders' expense (H1). However, given the positive association between leverage and earnings maximization discussed below, the positive sign for INS is consistent with owner-managers trying to increase the market value of their stock by reducing the cost of debt in highly levered firms (H2). This is because the higher the equity holdings of such managers, the stronger their incentives to maximize the book value of equity.

Because the estimated coefficient of LEV^n is positive, higher leverage increases the probability that a firm makes earnings maximizing consolidation choices. This is consistent with a

conflict of interest between owners and creditors (H2). The positive coefficient of the finance industry dummy IND^4 suggests that even after we account for financials having higher leverage than others (as reflected in the industry-adjusted LEV^n), they still tend to maximize earnings (H9). Moreover, the smaller they are, the more often they behave this way, which is inconsistent with H6.[14]

Panel C shows the performance of the prediction model. Each investor is assigned the most likely consolidation choice according to the estimated model. Column four documents that these predictions are correct in 69% of the cases, more often for maximizers (77%) than for minimizers (59%), and demonstrates that the model outperforms a naive prediction strategy of $P(E_0) = P(E_1) = \frac{1}{2}$. Because the sample distribution is almost equally weighted by maximizers (52%) and minimizers (48%), our model is also superior to a pundit who, unlike our model, knows the true ratio of maximizers to minimizers in the sample, but knows nothing about each investor's earnings management incentives as captured by the model.

Consistent earnings management across investments

An investor is *consistent* in a given year if it accounts for *every* investee in a way which either increases earnings or decreases earnings, but not both. This consistency property is not picked up by the base-case model in table 5, which treats every investment independently. A simple test of such consistency is to compute the ratio of consistent to inconsistent firm-years per investor per year, and compare this ratio to a reasonable criterion for inconsistent

[14]The insignificant coefficient of *CCR* does not mean that financials abstain from using earnings management techniques to satisfy regulatory capital coverage requirements. Beatty et al. (1995) document that US banks use a wide array of tools to manage their primary capital ratios, such as asset sales, the timing of equity issues, and the accounting for loan loss provisions, loan chargeoffs, and pension fund settlements. Using a system of five simultaneous equations, they find that studying one component at a time (such as the cost/equity choice for intercorporate investments) may be insufficient because most components of this package for capital coverage management are interlinked. While we recognize this problem, our moderate subsample of financials and the lack of required data makes the Beatty et al. (1995) approach infeasible. Instead, we test for alternative earnings management techniques for all our sample firms later in this section.

consolidation under the null hypothesis.

In our sample of 159 firm-years, 145 cases are consistent, such that $\bar{p} = 0.91$ is the fraction of consistent choices. If each choice is the outcome of a Bernoulli lottery, we may use the central limit theorem to approximate the binomial distribution by the Gaussian. Under the null hypothesis that the fraction of consistent firm-years is p_0, our test statistic is $(\bar{p} - p_0)/\sigma_0$, where $\sigma_0 = \sqrt{p_0(1-p_0)/159}$. The null hypothesis is rejected at the 1% level in favor of the alternative $\bar{p} > p_0$ for all $p_0 < 0.85$. Thus, our sample firms are consistent earnings managers.

Consistency across earnings management tools

The major empirical finding from the base-case model is that high-leverage firms in general and financials in particular tend to account for investees in earnings maximizing ways. Because earnings can be manipulated by other means than the cost/equity choice, this finding does not imply that our sample firms maximize earnings in general. Such a conclusion would only be warranted if the consolidation choice is not offset by other earnings management tools. As most earnings management research analyzes discretionary accruals, we explore how the earnings impact of this accounting choice interacts with the consolidation choice.[15]

We test whether investors that were found to maximize (minimize) their earnings in Table 5 have positive (negative) discretionary accruals as well. The tests and findings are discussed in detail in the appendix. Our key result is that discretionary accruals are positive (negative) on average for firms that maximize (minimize) earnings by their consolidation choice. Moreover, we cannot reject the hypothesis that firms that maximize (minimize) earnings with the consolidation choice have positive (zero) discretionary accruals on average, at the 5% level. Discretionary accruals and the consolidation choice are therefore complementary

[15]Extant studies of discretionary accruals typically do not control for the effect of other earnings management tools (e.g. Jones, 1991; Dechow et al., 1995). Therefore, their findings can hardly be interpreted as evidence of earnings management in general.

(independent) for earnings maximizers (minimizers). This means that because firms do not offset the effect of the consolidation choice with their accruals policy, our findings from the base-case model are robust to the use of other earnings management tools.

Leverage management in large investments

The base-case model shows that highly leveraged firms in general, and financials in particular, use the cost/equity choice to increase earnings and thus reduce their reported debt to equity ratio. According to the opportunistic behavior theory, investors manage earnings in this way to avoid costly debt renegotiation or to reduce regulatory exposure.

Once the fraction held is at least 50%, full consolidation of the income statement and the balance sheet is mandatory. Compared to the cost method, full consolidation increases the investor's leverage whenever the investee has a higher debt ratio than the investor. This means an investor who manages earnings has an incentive to keep large investments below the 50% limit and use the cost method whenever the investee's leverage exceeds the investor's. We expect this effect to be even more pronounced when the investor is a financial firm, since high debt may create higher costs for financials than for others.

To explore these conjectures, we analyze whether the choice between the cost and equity methods for [40–50%) investments depends on the leverage of the investor relative to the investee, and on the investor's industry. The lower limit of 40% is not dictated by theory, but by the desire to capture large investments and the need for a minimum sample size. Formally, we estimate the logit model

$$\Pr(\text{equity method}) = f\left(\zeta_0 + \zeta_1 \Delta LEV_{ijt} + \zeta_2 IND_i^4\right), \tag{2}$$

where Pr is probability and $\Delta LEV_{ijt} \equiv (LEV_{jt} - LEV_{it})/LEV_{it}$ is the leverage of investee j

relative to that of investor i at time t. IND_i^4 is an indicator function for the finance industry for investor i.

[Table 6 about here.]

Panel A of Table 6 shows that the estimated coefficients for relative leverage and the financial dummy in Panel B are both significantly different from zero and have the correct predicted signs. Panel C shows that 73% of the predictions are correct, which is close to the 67% we would get if we predict according to the fraction of sample cases that use the cost method (33/49).

As expected, we find that the relationship in (2) is weaker for investments below 40%, which includes 160 cases (not reported in the table). Both coefficients are still negative, but relative leverage is no longer significant. We interpret this evidence as additional support for the conjecture that the cost versus equity choice is used to reduce the investor's leverage, particularly in financials.

6 Conclusions

Unlike in North America and the E.U, Norwegian GAAP grant considerable discretion on the choice between the equity method and the cost method when accounting for 20–50% intercorporate investments. Since Bøhren et al. (2004) found that Norwegian firms do not comply with this flexible GAAP, we explore whether they instead exploit the regulatory slack to manage reported earnings. In particular, we study the characteristics of firms that choose to maximize earnings versus those that minimize earnings.

We supplement existing research by testing theories of opportunistic behavior and information signaling on a rather unexplored accounting choice in a different regulatory environment.

Our data allows for a simultaneous test of both theory classes by means of a single multivariate logit model. Mainstream research on earnings management, which mostly studies discretionary accruals, share a joint hypothesis problem by relying on an ad-hoc behavioral model for the earnings impact of an unobserved accounting choice. Our sample firms' choice of accounting method is directly observable, and the impact on earnings follows from well-defined accounting relationships. To alleviate the problem of potentially offsetting accounting method choices, we use a discretionary accruals test to control for consistency across earnings management tools.

Our findings suggest that managers do not distort reported earnings from intercorporate investments to extract private benefits or to signal revised expectations. Still, earnings management does occur, as highly levered firms of any type and financials in particular choose between the equity method and the cost method in order to maximize reported earnings. This suggests that flexible accounting standards are utilized to avoid debt renegotiation costs caused by covenant violations, or to reduce political costs by avoiding regulatory attention. The finding is consistent with extant evidence that debt financing triggers the use of accounting methods which reduce direct borrowing costs, either by maximizing reported earnings to increase interest coverage ratios or by fully consolidating subsidiaries in order to increase the asset base available for creditors. The observed interaction between our sample firms' discretionary accruals choice and their cost/equity choice suggests that the two tools are used consistently in terms of their effect on reported earnings.

Appendix: Earnings management by discretionary accruals

We first define total accruals and establish a model for non-discretionary accruals. Next, we estimate discretionary accruals as the difference between the two. Methodologically, these two steps are folded into one augmented regression model. Finally, we use the estimated discretionary accruals to test whether firms that maximize (minimize) earnings with the consolidation choice also maximize (minimize) earnings with discretionary accruals. Our sample is the subsample of firms that are consistent earnings managers across all their 19-50% intercorporate investments in a given year, i.e., that are earnings maximizers (minimizers) across every investment. We describe the methodology first and then proceed to analyze the estimates. Detailed results are reported for maximizers only.

Total accruals, TA, are defined as (see e.g. Holthausen et al., 1995):

$$TA_{it} \equiv \Delta CA_{it} - \Delta C_{it} - \Delta CL_{it} + \Delta SD_{it} - DAE_{it} - DTE_{it} + EII_{it}, \tag{3}$$

where CA is current assets, C is cash and short-term investments, CL is current liabilities, SD is short-term debt, DAE is depreciation and amortization expense, DTE is deferred tax on earnings, EII is the earnings effect of the equity method, and $\Delta X_t = X_t - X_{t-1}$.

We estimate non-discretionary accruals in the years when firms do not use the consolidation choice to maximize earnings. Following Dechow et al. (1995), we call this the *the estimation period* and denote it $\hat{S}$. We assume non-discretionary accruals are generated independently by each firm in the estimation period according to the linear model proposed by Jones (1991):

$$NDA^*_{it} = \xi^*_{0i} + \xi_{1i} \triangle REV^*_{it} + \xi_{2i} PPE^*_{it}, \quad it \in \hat{S}, \tag{4}$$

where $*$ denotes division by beginning of period book value of assets, REV is total revenue, and PPE is the book value of property, plant and equipment. We estimate the firm-specific

ξ-coefficients in (4) by regressing total accruals as defined in (3) on ΔREV^* and PPE^*:

$$TA^*_{it} = \hat{\xi}^*_{0i} + \hat{\xi}_{1i} \triangle REV^*_{it} + \hat{\xi}_{2i} PPE^*_{it} + \nu_{it}, \quad it \in \hat{S}. \tag{5}$$

Coefficient estimates from (5) are then used to compute NDA^*_{it} for each firm-year in the *event period* S^e, defined as the firm-years when investors consistently maximize earnings by their consolidation choice across all investments. Applying the modified Jones-model of Dechow et al. (1995), which corrects for receivables REC^*_{it}, we get:

$$NDA^*_{it} = \hat{\xi}^*_{0i} + \hat{\xi}_{1i} \left(\triangle REV^*_{it} - \triangle REC^*_{it} \right) + \hat{\xi}_{2i} PPE^*_{it}, \quad it \in S^e. \tag{6}$$

The estimation period coefficients $\hat{\xi}$ from (5) and the event period NDA^*_{it} from (6) are estimated by augmented regression models. Finally, we compute discretionary accruals as $DA^*_{it} = TA^*_{it} - NDA^*_{it}$.

Requiring at least eight observations in the estimation period, the available sample consists of 18 firms listed on the OSE during 1980–1996.[16] This produces estimation and event periods of 212 and 36 firm-years, respectively, with an average of 11.8 observations per firm in the estimation period.

We test the hypothesis following the methodology of Jones (1991) and discuss the findings reported in Table 7 in two steps. First, to compare our results to those of Jones (1991), we present the estimated non-discretionary accruals model in the estimation period in panels A.I, B.I, and C.I. Subsequently, we test for earnings management through discretionary accruals in the event period in panels A.II, B.II, and C.II.

Panels A, B and C are based on three different ways of recognizing the earnings effect of

[16]There are 41 unique intercorporate investors in the sample that maximize earnings from one or more investments. 18 of these firms have at least eight observations in the estimation period and report the data we need to estimate accruals.

the equity method when defining total accruals. Panel A uses the definition in equation (3), which includes the effect of all investments accounted for by the equity method. Since the positive earnings effect of consolidating OSE-listed investments defines our event period, one may argue that the earnings effect of this alternative earnings management tool should not influence total accruals. The total accruals in Panel B therefore include only the earnings effect of investments in *non*-OSE firms, which are not used to define the event period. Finally, since some accruals papers do not include the earnings effect from the equity method, and because the equity method is fundamentally different from what we normally think of as accruals, we ignore any consolidation effect in the measure of accruals in Panel C.

[Table 7 about here.]

To evaluate the hypothesis of positive (negative) average discretionary accruals, we use the test statistic $z \equiv \left(\sum_{it \in S^e} \frac{DA^*_{it}}{\sigma(DA^*_{it})}\right) / \sqrt{\sum_{it \in S^e} \frac{T_i - 3}{T_i - 5}}$, where $\sigma(DA^*_{it})$ is the adjusted standard error for discretionary accruals, and T_i is the number of observations on firm i in the estimation period. The estimates in panels A.II, B.II and C.II have z-values of 1.77, 1.74 and 1.81, with upper tail p-values of 0.039, 0.040 and 0.035, respectively. Thus, there is evidence that when firms choose to be earnings maximizers through the cost/equity decision, they behave correspondingly in the choice of discretionary accruals.[17]

The sample of earnings minimizers consists of 18 firms with at least eight observations in the estimation period (not reported in the table). Estimation and event periods consist of 215 and 40 firm-years respectively. The total number of firm-years is 255, with an average of 11.9 observations per firm in the estimation period. Like for earnings maximizers, discretionary

[17]The signs of the parameter estimates in panels A.I, B.I, and C.I generally differ from those found by Jones (1991), and our R^2 estimates are slightly higher. The mean coefficients in Jones' paper have large standard errors, and the mean and the median have opposite signs in one case. Although the standard errors are even higher in our data (probably due to higher sampling errors in a small sample), the differences in estimated signs between the two papers is probably due to some extreme observations. This is evident from the maximal value for the third coefficient in our data compared to that of Jones. By removing some of the outliers we get coefficient estimates with the same sign and largely the same magnitude as in Jones' Table 4 (0.08, 0.12, and -0.19 respectively.)

accruals for firms that minimize earnings by the cost/equity choice are not significantly different from zero at conventional levels. The lower tail p-values vary from 0.08 to 0.20. However, firms that minimize reported earnings by the consolidation choice do not offset this effect with discretionary accruals.

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Table 1

The hypotheses

The table summarizes the predictions from Section 2. The labels in the left column are used for later reference. The variables in the right column are empirical proxies to be defined in Section 3.

	Opportunistic behavior	
H1	Firms are more likely to maximize earnings the lower their ownership concentration and the smaller their insider holdings.	INS, CON
H2	Firms are more likely to maximize earnings the higher their leverage.	LEV
H3	Firms are more likely to maximize earnings the lower their interest coverage ratio.	INT
H4	Financials are more likely to maximize earnings the closer they are to their minimum capital requirements.	CCR
H5	Non-financials are more likely to maximize earnings the smaller they are.	SIZ
H6	Financials are more likely to maximize earnings the larger they are.	SIZ, IND[4]
H7	Firms are more likely to maximize earnings the lower their effective tax rate.	TAX
	Asymmetric information	
H8	Firms are more likely to maximize earnings the lower their quality.	PER
	Industry practice	
H9	Accepted accounting principles for intercorporate investments vary across industries.	**IND**

INS is the fraction of shares held by insiders, CON is the fraction of shares held by the three largest investors, LEV is financial leverage, INT is the interest coverage ratio, CCR is closeness to minimum capital requirements set by regulators, SIZ is firm size, IND is the industry of the firm's main operations, TAX is the effective tax rate, PER is the firm's return to equity relative to the average of its industry, and **IND** is a vector of indicator functions identifying the firm's industry.

Table 2

The potential effect on reported investor earnings from using the equity method rather than the cost method for all 19–50% intercorporate investments by OSE firms in 1984–94

The table shows the absolute value of the earnings impact ratio, which is the relative earnings effect of using the equity method (i.e., consolidate) rather than the cost method (i.e., not consolidate). The table reports the findings for all intercorporate investors in the sample, for earnings maximizers (who consolidate to increase earnings or do not consolidate if that would have decreased earnings), and for earnings minimizers (who consolidate to decrease earnings or do not consolidate if that would have increased earnings). The impact ratio is total investor earnings under the equity method minus total investor earnings under the cost method, divided by total investor earnings before taxes. Panels A and B show the number of observations (N), the mean, median, and the standard deviation (Std.) across industries (Panel A) and years (Panel B). The weighted mean is equally weighted across firm-years. Panel C shows properties of the unconditional frequency distribution. One-sided p-values are reported for differences of means between earnings maximizers and earnings minimizers.

	All				Earnings maximizers				p-value	Earnings minimizers			
	N	Mean	Median	(Std.)	N	Mean	Median	(Std.)		N	Mean	Median	(Std.)
Panel A: Earnings impact by industry													
Petroleum	8	0.08	0.05	(0.13)	5	0.05	0.04	(0.05)	0.201	3	0.15	0.05	(0.20)
Manufact.	104	0.13	0.02	(0.29)	49	0.17	0.02	(0.39)	0.101	55	0.09	0.03	(0.16)
Shipping	50	0.71	0.19	(2.06)	22	0.88	0.08	(3.05)	0.305	28	0.57	0.35	(0.64)
Real estate	1	0.11	0.11	(0.00)	1	0.11	0.11	(0.00)	–	0	0.00	–	(0.00)
Finance	47	0.23	0.01	(0.62)	32	0.31	0.01	(0.73)	0.122	15	0.07	0.01	(0.24)
Insurance	4	1.64	0.75	(2.38)	3	1.70	0.04	(2.91)	–	1	1.45	1.45	(0.00)
Wgt. mean		0.31				0.38					0.24		
Panel B: By Year													
1984	22	0.24	0.05	(0.55)	12	0.29	0.01	(0.72)	0.307	10	0.17	0.06	(0.23)
1985	31	0.18	0.03	(0.39)	11	0.16	0.01	(0.45)	0.444	20	0.19	0.05	(0.37)
1986	32	0.33	0.03	(0.94)	15	0.52	0.05	(1.30)	0.154	17	0.17	0.02	(0.43)
1987	23	0.05	0.01	(0.09)	18	0.05	0.01	(0.10)	0.207	5	0.01	0.01	(0.02)
1988	18	0.14	0.04	(0.23)	11	0.06	0.07	(0.06)	0.036	7	0.27	0.02	(0.33)
1989	17	0.26	0.02	(0.54)	9	0.24	0.02	(0.65)	0.431	8	0.29	0.08	(0.41)
1990	18	0.32	0.03	(0.68)	8	0.24	0.03	(0.49)	0.346	10	0.38	0.02	(0.82)
1991	13	0.22	0.18	(0.31)	9	0.26	0.18	(0.36)	0.310	4	0.15	0.14	(0.13)
1992	16	1.33	0.26	(3.53)	7	2.42	0.23	(5.31)	0.163	9	0.48	0.30	(0.60)
1993	14	0.20	0.03	(0.33)	7	0.17	0.03	(0.34)	0.387	7	0.23	0.03	(0.34)
1994	10	0.48	0.02	(1.00)	5	0.70	0.00	(1.38)	0.279	5	0.25	0.02	(0.50)
Wgt. mean		0.31				0.38					0.24		
Panel C: The unconditional frequency distribution of the earnings impact													
Maximum		14.41				14.41					2.61		
75% quartile		0.20				0.16					0.25		
Mean		0.31				0.38			0.173		0.24		
Median		0.03				0.02					0.05		
25% quartile		0.01				0.00					0.01		
Minimum		0.00				0.00					0.00		
Std.		1.13				1.50					0.44		
Number of obs.		214				112					102		

Table 3

Earnings management by year and industry for intercorporate investments between 19% and 50% by firms listed on the OSE in 1984–1994

The table reports the fraction of firms using the equity method and the cost method in the whole sample and in the two subsamples of earnings maximizers (who use the equity method to increase earnings or do not use the cost method if that would have decreased earnings), and for earnings minimizers (who use the equity method to decrease earnings or do not use the cost method if that would have increased earnings). All fractions are relative to the sample size in the second column.

	Observations	Equity method, all	Maximizers		Minimizers	
			Equity method	Cost method	Equity method	Cost method
Panel A: By year						
1984	22	0.09	0.09	0.45	0.00	0.45
1985	31	0.13	0.06	0.29	0.06	0.58
1986	32	0.13	0.06	0.41	0.06	0.47
1987	23	0.35	0.30	0.48	0.04	0.17
1988	18	0.28	0.17	0.44	0.11	0.28
1989	17	0.12	0.06	0.47	0.06	0.41
1990	18	0.50	0.17	0.28	0.33	0.22
1991	13	0.46	0.23	0.46	0.23	0.08
1992	16	0.56	0.06	0.38	0.50	0.06
1993	14	0.57	0.36	0.14	0.21	0.29
1994	10	0.50	0.40	0.10	0.10	0.40
Mean	19.45	0.33	0.18	0.35	0.16	0.31
Median	18	0.35	0.17	0.41	0.10	0.29
Panel B: By industry						
Total	214	0.29	0.15	0.37	0.14	0.34
Petroleum	8	0.13	0.00	0.63	0.13	0.25
Manufact.	104	0.44	0.28	0.19	0.16	0.37
Shipping	50	0.22	0.08	0.36	0.14	0.42
Real est.	1	0.00	0.00	1.00	0.00	0.00
Finance	47	0.09	0.00	0.68	0.09	0.23
Insurance	4	0.00	0.00	0.75	0.00	0.25

Table 4

Earnings management by investor characteristics for intercorporate investors listed on the OSE in 1984–1994

The table reports mean, median, and (standard deviation) of investor characteristics by earnings management behavior. Earnings maximizers (minimizers) are investors that either use the equity method when this method increases (decreases) investor earnings relative to the cost method, or use the cost method when the equity method would have decreased (increased) earnings. The number of observations varies across the subsets since one investor can be classified as both an earnings maximizer and minimizer, both within and across years. The next to last row shows the number of unique observations of investor characteristics across time, regardless of accounting choice. One-sided p-values are calculated for each variable for the difference in means between earnings maximizers and minimizers.

Consolidation choice (CHO)	Number of observations	INS	CON	LEV	CCR	INT	SIZ	TAX	PER
Earnings maximizers (E_0)	88	0.10	0.42	0.66	0.23	0.194	0.145	0.14	1.01
		0.00	0.40	0.68	0.20	0.042	0.152	0.12	1.00
		(0.17)	(0.21)	(0.24)	(0.17)	(0.231)	(0.030)	(0.38)	(0.26)
Earnings minimizers (E_1)	85	0.05	0.39	0.62	0.18	0.175	0.146	0.53	0.98
		0.00	0.31	0.60	0.14	0.048	0.150	0.13	1.00
		(0.13)	(0.19)	(0.21)	(0.14)	(0.213)	(0.024)	(4.04)	(0.07)
All investors ($E_0 \cup E_1$)	159	0.08	0.41	0.64	0.21	0.187	0.145	0.36	1.00
		0.00	0.38	0.64	0.17	0.049	0.151	0.12	0.99
		(0.15)	(0.20)	(0.23)	(0.16)	(0.222)	(0.025)	(2.96)	(0.20)
Number of observations		143	98	159	20	159	159	159	132
One-sided p-value		0.007	0.173	0.101	0.253	0.288	0.370	0.186	0.188

INS is the fraction of equity held by insiders, *CON* is the fraction of equity held by the three largest investors, *LEV* is the financial leverage ratio, *CCR* is the percentage distance between a financial's capital coverage and the minimum coverage set by the regulator, *INT* is the interest coverage ratio, *SIZ* is firm size measured by sales in bill. NOK as of 1994, *TAX* is the effective tax rate, and *PER* is the firm's return to equity relative to its industry average.

Table 5

Estimation of the base-case earnings management model (1) for intercorporate investments by OSE firms in 1984–1993

The table shows predicted signs of the coefficients and statistics of the logit regression evaluated at the model

$$\beta_0 + \beta_1 INS_{it} + \beta_2 CON_{it} + \beta_3 LEV^n_{it} + \beta_4 CCR_{it} + \beta_5 INT^n_{it} + \beta_6 SIZ_{it} + \beta_7 SIZ^n_{it} IND^4_i + \beta_8 TAX_{it} + \beta_9 PER_{it} + \beta_{10} IND^4_i + \beta_{11} S(t).$$

The sample contains 118 intercorporate investments between 19 and 50%. 35 cases are removed due to missing estimates of *PER*. 73 and 19 investments are removed due to missing data for *CON* and *INS*, respectively. As the missing observations are partially overlapping, a total of 96 observations are removed from the initial sample. We report the log likelihood ratios in Panel A, the predicted signs and the parameter estimates in Panel B, and actual versus predicted consolidation choice in Panel C.

Panel A: Likelihood ratios

Model	-log likelihood	χ^2 $(p > \chi^2)$	N
Unrestricted	67.09	25.990	118
Restricted: $\beta_1, \ldots, \beta_{11} \equiv \mathbf{0}$	80.09	(0.007)	

Panel B: Parameter estimates

Independent variable	Predicted sign	Coefficients	Likelihood ratio	p-value
Intercept		1.84		
INS	−	4.31	4.28	0.04
CON	−	−0.01	0.40	0.53
LEV^n	+	3.22	5.55	0.02
INT^n	−	−0.13	0.35	0.55
$CCR \times IND^4$	−	8.94	2.41	0.12
SIZ	−	−0.17	0.81	0.37
$SIZ^n \times IND^4$	+	−2.09	5.11	0.02
TAX	−	0.07	0.02	0.89
PER	−	−2.70	0.48	0.49
IND^4		2.06	5.03	0.03
$S(t)$	+	1.01	3.19	0.07

Panel C: Hits of predicted consolidation choice

CHO	Total	Number of hits	Fraction hits
E_0 (earnings maximizers)	69	53	0.77
E_1 (earnings minimizers)	49	29	0.59
$E_0 \cup E_1$	118	82	0.69

The likelihood ratios are approximately χ^2 distributed. Critical values at the 0.10 and 0.01 levels are 2.71 and 6.63, respectively. Degrees of freedom in the log likelihood ratio equals the number of restricted parameters, which is 13. The χ^2-statistic is computed in the standard way as $-2\left(\ln \mathcal{L}_{\text{restr.}} - \ln \mathcal{L}_{\text{unrestr.}}\right)$, where $\mathcal{L}$ is the log likelihood function.

INS is the fraction of shares held by insiders, *CON* is the fraction of shares held by the three largest investors, LEV^n is the firm's normalized leverage ratio, *CCR* is the percentage distance between a financial's capital coverage and the minimum coverage set by the regulator, INT^n is the firm's normalized interest coverage ratio, *SIZ* is firm size measured by sales in bill. NOK as of 1994, SIZ^n is industry-normalized sales, IND^4 is a dummy variable for the finance industry, *TAX* is the effective tax rate, *PER* is the firm's return to equity relative to the average of its industry, and $S(t)$ equals unity when $t \geq 1990$ and zero otherwise.

Table 6

Leverage management through the cost method in large investments by OSE firms in 1984–93

The table shows predicted signs of the coefficients and statistics of the logit regression Pr(equity method) evaluated at

$$\zeta_0 + \zeta_1 \Delta LEV_{ijt} + \zeta_2 IND_i^4$$

The subsample consists of 49 investments between 40% and 50%. We report the log likelihood ratios in Panel A, the predicted signs and the parameter estimates in Panel B, and actual versus predicted consolidation choice in Panel C.

Panel A: Likelihood ratio

Model	-log likelihood	χ^2 $(p > \chi^2)$	N
Unrestricted	25.49	10.73	49
Restricted: $\zeta_1, \zeta_2 = 0$	30.95	(0.01)	

Panel B: Parameter estimates

Independent variable	Predicted sign	Coefficients	Likelihood ratio	p-value
Intercept		−0.29		
ΔLEV	−	−2.13	6.50	0.01
IND^4	−	−11.12	5.81	0.02

Panel C: Hits of predicted consolidation choice

CHO	Total	Number of hits	Fraction hits
EM	16	5	0.31
CM	33	31	0.94
$EM \cup CM$	49	36	0.73

The likelihood ratios are approximately χ^2 distributed. Critical values at the 0.10 and 0.01 levels are 2.71 and 6.63 respectively. Degrees of freedom in the log likelihood ratio equals the number of restricted parameters, which is 2. The χ^2-statistic is computed in the standard way as $-2\left(\ln \mathcal{L}_{\text{restr.}} - \ln \mathcal{L}_{\text{unrestr.}}\right)$, where $\mathcal{L}$ is the log likelihood function.

ΔLEV is the leverage of the investee relative to the leverage of the investor. IND^4 equals unity when the investor is in the finance industry, and zero otherwise.

Table 7

Earnings management by discretionary accruals in a subsample of firms listed on the OSE in 1980–1996

Panels A.I, B.I, and C.I show estimated coefficients of the non-discretionary accruals model (6) in the estimation period, using three alternative definitions of total accruals. Panels A.II, B.II, and C.II show statistics of the estimated discretionary accruals in the event period, using three alternative definitions of total accruals. DA^*_{it} is estimated accruals per unit book value of assets, and *EII* is the earnings effect of using the equity method. The t-values are shown in parentheses.

	Mean	Standard deviation	Minimum	Maximum
Panel A.I: Estimation period parameters[a]				
$\hat{\xi}^*_0$	−0.088	0.225	−0.648	0.402
	−(0.932)	(2.332)	−(8.816)	(2.370)
$\hat{\xi}_1$	−0.049	0.413	−1.635	0.367
	(0.035)	(2.015)	−(6.033)	(3.007)
$\hat{\xi}_2$	0.066	0.406	−0.647	1.081
	(0.565)	(2.397)	−(2.434)	(8.842)
R-square	0.353	0.244	0.026	0.994
Panel A.II: Event period parameters				
DA^*_{it}	0.157	0.542	−0.334	2.801
Panel B.I: Estimation period parameters where *EII* only reflects non-OSE firms[b]				
$\hat{\xi}^*_0$	−0.088	0.225	−0.648	0.402
	−(0.933)	(2.331)	−(8.816)	(2.370)
$\hat{\xi}_1$	−0.050	0.413	−1.635	0.367
	(0.033)	(2.016)	−(6.033)	(3.007)
$\hat{\xi}_2$	0.067	0.405	−0.647	1.081
	(0.568)	(2.395)	−(2.434)	(8.842)
R-square	0.353	0.244	0.026	0.994
Panel B.II: Event period parameters where *EII* only reflects non-OSE firms				
DA^*_{it}	0.156	0.543	−0.354	2.801
Panel C.I: Estimation period parameters with $EII = 0$[c]				
$\hat{\xi}^*_0$	−0.089	0.226	−0.648	0.402
	−(0.941)	(2.332)	−(8.816)	(2.370)
$\hat{\xi}_1$	−0.057	0.415	−1.635	0.372
	(0.016)	(2.021)	−(6.033)	(3.007)
$\hat{\xi}_2$	0.062	0.396	−0.650	1.012
	(0.565)	(2.399)	−(2.434)	(8.842)
R-square	0.356	0.247	0.024	0.994
Panel C.II: Event period parameters with $EII = 0$				
DA^*_{it}	0.163	0.546	−0.340	2.801

[a]Estimates in panels A.I and A.II define total accruals as TA_{it} in equation (3).

[b]Estimates in panels B.I and B.II are based on total accruals that only include the earnings effect of intercorporate investments in non-OSE firms.

[c]Estimates in Panel C.I and C.II are based on $TA_{it} - EII_{it}$ as the total accruals measure, which means no earnings from the equity method is included in total accruals, regardless of whether the investee is listed or not.