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Chapter 5 Detecting Earnings Management: A review

5.1 Introduction

While earnings management receives a lot of attention both in the popular press and in the academic press, academic research has yet to present as convincing results showing earnings management as the financial press has. Regulators and practitioners seem to believe that earnings management is both pervasive and problematic. However, academic research has not demonstrated that earnings management has a large effect on average on reported earnings (Dechow and Skinner, 2000). One of the reasons for this is the research design used to examine earnings management. Academics usually wish to make general statements about earnings management by examining large samples of firms, and tend to use statistical definitions of earnings management that may not be very powerful in identifying earnings management (see for instance Kang and Sivaramankrishnan, 1995; Dechow et al., 1995; Guay et al., 1996; Bernard and Skinner, 1996; Thomas and Zhang, 1999; Healy and Wahlen, 1999; Dechow and Skinner, 2000; McNichols, 2000; Kothari, 2001; Beaver, 2002, Kothari et al., 2005).⁴²

Earnings management deals with accrual accounting. Earnings management concerns managers using their discretion over accounting accruals and accounting choices, presumably for a private purpose. However, GAAP requires management to make judgments and estimates in order to provide periodical financial reports. In fact, certain forms of earnings management, such as income smoothing, are hard to distinguish from appropriate accounting choices (Dechow and Skinner, 2000). The critical issue seems to be distinguishing regular accrual accounting from earnings management.

A large body of work has been developed in the earnings management stream of research, and interest in this subject remains high. Therefore, it is useful to get a better understanding of the earnings management research, and the challenges it faces and present to researchers. In this chapter, I discuss the extent to which earnings management can be defined and measured.

⁴² Other reasons for this disparity presented by Dechow and Skinner (2000) are that academics have focused on particular samples and incentives that are not interesting to practitioners and have not been successful at identifying earnings management behavior ex-post, and that academics and practitioners tend to have different views on the extent to which investor rationality mitigates financial reporting –problems such as earnings management.

5.2 Defining Earnings Management

Understanding earnings management concerns one of the central questions in accounting, i.e. the influence and importance of accounting accruals in arriving at a summary measure of firm performance (Schipper, 1989). The principal goal of accrual accounting is to help investors assess the entity's economic performance during a period through the use of basic accounting principles such as revenue recognition and matching. Research has shown that the accrual process results in earnings that are smoother than underlying cash flows, since accruals tend to be negatively related to cash flows, and that earnings provide better information about future economic performance to investors than cash flows (Dechow, 1994).

Empirical evidence indicates that accruals have information content. The question is, when does the use of accruals hamper the informativeness and the usefulness of the accounting process? It is important to realize that earnings management has the ability for the essential beneficial role of providing a means for managers to reveal their private information (Schipper, 1989). When earnings management is used as a vehicle for the communication of management's inside information to investors, the somewhat surprising conclusion is that a little bit of earnings management can be "good" (Scott, 2003, p. 368). Barth et al. (1999) for instance report that firms that show a consistent pattern of earnings growth are rewarded by the market with a higher PE-ratio.

Earnings management has to be defined before you can discuss it. However, that in itself is not an easy task, because there really is no single definition of earnings management. As mentioned, earnings management can be good or bad. Whichever vantage point a researcher may take depends on the definition of earnings management. Schipper (1989, p. 92) defines earnings management as:

“ disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the extent of obtaining some private gain, as opposed to merely facilitating the neutral operation of the process.”

Under this definition, earnings management could occur in any part of the external disclosure process, and could take a number of forms. A minor extension to the definition would encompass

“real “earnings management, accomplished by timing investments or financing decisions to alter reported earnings or some subset of it.

Within this definition, earnings management is approached from an informational perspective. Under this perspective, earnings are one of many signals which may be used to make certain decisions and judgments. All that matters here is the information content, which is a statistical property. The actual value of the earnings number is not an important attribute. This is opposed to the economic income perspective, also called the true income perspective.

Under the true income perspective, some economic number, such as economic income, is distorted. This can be done either by earnings management, but also by the rules of accrual accounting and GAAP. Accounting rules produce an accounting number which measures the true income with error, where the benchmark used to evaluate the degree of such measurement error is a true income metric. Therefore, the true income perspective implies that unmanaged earnings are a noisy measure of a benchmark, and that managing earnings changes the properties of the noise (such as amount, bias or variance). The change in properties determine the effect of the earnings management, whether it is good or bad.

As Schipper (1989) mentions, the perspective taken matters, because it has implications for interpreting results of earnings management research. Healy and Wahlen (1999) take the perspective of the standard setters for financial reporting and the view that standards add value when they enable financial statements to effectively portray differences in firm’s economic positions and performance in a timely and credible manner. They are interested in deciding how much judgment to allow management to exercise in financial reporting, which leads them to the following definition of earnings management (1999, p. 368):

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”

Healy and Wahlen (1999) assign a negative value to earnings management, i.e. to mislead. Their definition points out that managers can use many ways to exercise judgment, and that they do this to mislead stakeholders about the underlying economic performance of the firm. Decisions to use accounting judgment to make financial reports more informative for users do not fall within this definition of earnings management. This definition moves away from the information perspective then. However, these definitions are difficult to operationalize directly using attributes of reported

accounting numbers, since they center on managerial intent, which in itself is unobservable. In fact, the only form of earnings management that has a clear definition is maybe the most extreme form of earnings management, financial fraud. In this case, the managerial intent is clear, which results in a clear definition of earnings management (Dechow and Skinner, 2000, p. 238):

“the intentional, deliberate, misstatement or omission of material facts, or accounting data, which is misleading and, when considered with all the information made available, would cause the reader to change or alter his or her judgment or decision.”

Figure 5.1, taken from Dechow and Skinner (2000) shows out the many ways how managers can exercise judgment over financial reports.

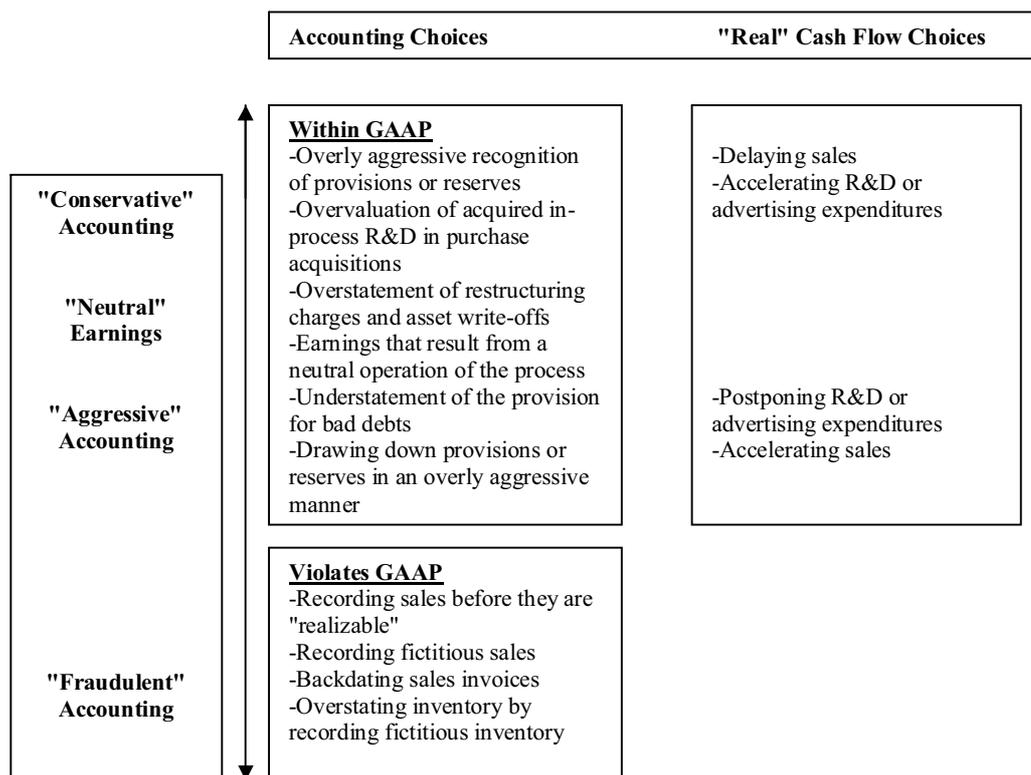


Figure 5.1 Management discretion over accounting choices

It has been remarkably difficult for researchers to convincingly document earnings management (Healy and Wahlen 1999). The major problem with earnings management research is that, in

order to identify whether earnings have been managed, researchers first have to estimate earnings before the effects of earnings management. One common approach is to first identify conditions in which managers' incentives to manage earnings are likely to be strong, and then test whether patterns of unexpected or discretionary accruals or accounting choices are consistent with these incentives. Two critical research design issues arise for these studies. First, they have to identify managers' reporting incentives. Second they have to measure the effects of managers' use of accounting discretion in unexpected accruals or accounting method choices. Previous research has examined the first issue and came up with different types of incentives for earnings management.⁴³ These include capital market expectations and valuation, contracts written in terms of accounting numbers and anti-trust or other government regulation.

The second issue, the measurement of the effects of managers' use of accounting discretion will be discussed in the next paragraph.

5.3 Earnings Management Research Designs

As McNichols (2000) points out, an essential part of any test for earnings management is a measure of management's discretion over earnings. The literature has followed several approaches, with varying characteristics. However, there are three research designs that are commonly used. First, there is a large literature that attempts to identify discretionary accruals based on the relation between total accruals and hypothesized explanatory factors. This literature began with Healy (1985) and DeAngelo (1986), who used total accruals and change in total accruals, respectively, as measures of management's discretion over earnings. Jones (1991) introduced a regression approach to control for nondiscretionary factors influencing accruals, specifying a linear relation between total accruals and change in sales and property, plant and equipment. These approaches are typically called aggregate accruals studies.

⁴³ This study focuses on research on earnings management primarily through accruals. As the focus in this chapter is the design of earnings management studies, I will not discuss the incentives for earnings management in-depth. For a more extensive examination of these incentives, the reader is referred to Healy and Wahlen (1999). There is also extensive research done on compensation-motivated earnings management. This and other earnings management literature on the debt and political cost hypotheses that originated with the positive accounting theory (see Watts and Zimmerman, 1986) is beyond the scope of this review, unless it is related to the capital markets research. Also, the literature on the choice of accounting principles is not discussed. For an excellent review of this literature, see Fields et al. (2001).

A second approach in the literature is to model a specific accrual, as in McNichols and Wilson (1988). These studies often focus on industry settings in which a single accrual is sizable and requires substantial judgment. Based on these characteristics, as well as anecdotal evidence, the researchers have priors that management's discretion is likely to be reflected in a specific accrual or set of accruals. As with aggregate accruals studies, a key aspect of the research design task is modeling the behavior of each specific accrual to identify its discretionary and nondiscretionary components.

A third approach is to examine the statistical properties of earnings to identify behavior that influences earnings, as developed by Burgstahler and Dichev (1997) and DeGeorge et al. (1999). These studies focus on the behavior of earnings around a specified benchmark, such as zero or a prior quarter's earnings, to test whether the incidence of amounts above and below the benchmark are distributed smoothly, or reflect discontinuities due to the exercise of discretion. I will first describe all three approaches in detail and discuss recent developments for the different designs. I then conclude this chapter with search of the use of research designs used in the accounting literature.

5.3.1 Aggregate accrual models

A major issue with respect to the power of this research is the ability to identify proxies or conditioning variables that reflect the discretionary and nondiscretionary components of the accrual (Beaver, 2002). In the Jones model, sales is the key nondiscretionary variable driving current accruals, and capital expenditures is the key variable driving non-current accruals. Total accruals are then regressed on only the nondiscretionary accruals and it is assumed that the residual is discretionary. Failure to identify fully the nondiscretionary component implies the regression residual contains both discretionary and nondiscretionary components, leading the research to measure the estimated discretionary and nondiscretionary components with error. To interpret accruals-based tests as evidence for earnings management, one must be confident that measurement error in the discretionary accrual proxy is not correlated with an omitted variable in the estimation of the discretionary accrual. McNichols (2000) shows that discretionary accruals are correlated with growth. Specifically, she shows that aggregate accruals models that do not incorporate long term earnings growth are potentially mis-specified and can result in misleading inferences regarding earnings management (McNichols, 2000; Beaver, 2002).

Another potential problem with the aggregate accruals models relate to the quality of the accruals. Accruals shift or adjust the recognition of cash flows over time, so the adjusted number,

i.e. earnings, better measures firm performance. However, accruals are frequently based on assumptions and estimates that, if wrong, must be corrected in future accruals and earnings. Dechow and Dichev (2002) argue that the estimation error and their subsequent corrections are noise that reduces the beneficial role of accruals, and that the quality of accruals and earnings is decreasing in the magnitude of accrual estimation errors. Where the earnings management literature using aggregate models suggest that managerial intent affects the incidence and magnitude of accrual estimation errors, they do not attempt to disentangle “intentional” estimation errors from unintentional errors because both imply low-quality accruals and as a result low quality earnings. For instance, it may be the case that a company has too high accruals because the manager in charge unintentionally made a too high estimation of an accrual, for instance because of incompetence. This may lead researchers to claim high discretionary accruals, inferring earnings management, when in fact it was an error in estimating the accrual.

The potential misspecifications in testing for earnings management using aggregate accrual models can be explained, using the following linear framework for accrual-based tests (McNichols and Wilson 1998, Dechow et al. 1995):

$$DA_t = \alpha + \beta PART_t + \sum_{k=1}^K \gamma_k X_{kt} + \varepsilon_t \quad (3.1)$$

where

DA = discretionary accruals (typically deflated by lagged total assets);

PART = a dummy variable partitioning the data set into two groups for which earnings management predictions are specified by the researcher;

X_k = (for $k = 1, \dots, K$) other relevant variables influencing discretionary accruals; and

ε = an error term that is independently and identically normally distributed.

In most research contexts, PART will be set equal to one in firm-years during which systematic earnings management is hypothesized in response to the stimulus identified by the researcher (the "event period") and zero during firm-years in which no systematic earnings management is hypothesized (the "estimation period"). The null hypothesis of no earnings management in response to the researcher's stimulus will be rejected if beta, the estimated coefficient on PART, has the hypothesized sign and is statistically significant at conventional levels.

Unfortunately, the researcher cannot readily identify the other relevant variables, (the X_k s), and so excludes them from the model. Similarly, the researcher does not observe DA, and is forced to use a proxy, (DAP), that measures DA with error, (u):

$$DAP_t = DA_t + \mu_t \quad (3.2)$$

The error, μ_t , reflects the effects of omitted variables in the estimation of DA, as well as idiosyncratic variation. Jones (1991, pp. 210-212) measures DAP as A, aggregate accruals, less estimated nondiscretionary accruals, NAEST:

$$DAP = A - NAEST \quad (3.3)$$

where NAEST is characterized as the prediction error from an equation regressing total accruals on the change in revenues and level of property, plant and equipment.

Thus, the correctly specified model can be expressed in terms of the researcher's proxy for discretionary accruals as

$$DA_t = \alpha + \beta PART_t + \sum_{k=1}^K \gamma_k X_{kt} + \mu_t + \varepsilon_t \quad (3.4)$$

This model can be summarized as:

$$DA_t = \alpha + \beta PART_t + \mu_t + \varepsilon_t \quad (3.5)$$

where μ_t captures the sum of the effects of the omitted relevant variables on discretionary accruals and the error in the researcher's proxy for discretionary accruals. Given the regular Gaussian assumptions, the Ordinary Least Squares (OLS) estimate of β , ($\hat{\beta}$), from a multiple regression of DAP on PART and μ is the best unbiased estimator of β . Also, the ratio of ($\beta - \hat{\beta}$) to its standard error, $SE(\hat{\beta})$, has a t-distribution, which can be used to test for earnings management. This framework therefore provides a benchmark for evaluating the case where μ is omitted from the regression. The model of earnings management typically estimated by the researcher can be represented as

$$DAP_t = \hat{\alpha} + \hat{\beta} PART_t + \mu_t \quad (3.6)$$

Were:

$$\hat{\beta} = \beta + \rho(PART, \eta) * \sigma_{\eta} / \sigma_{PART} \quad (3.7)$$

Which can be written as:

$$\hat{\beta} = \beta + bias \quad (3.8)$$

The error term η reflects the effects of omitted variables in the estimation of DA as well as idiosyncratic variation in DAP conditional on DA. As McNichols and Wilson (1988, p. 6) show, $\hat{\beta}$ is a biased estimate of β if the partitioning variable is correlated with η , the measurement error in the estimate of discretionary accruals. To interpret accruals-based tests as evidence that earnings management did not occur, one must be confident that the discretionary accrual proxy is sufficiently sensitive to reflect it. To interpret accruals-based tests as evidence that earnings management occurred, one must be confident that measurement error in the discretionary accrual proxy is not correlated with the partitioning variable in the study's research design.

The researcher's model is mis-specified by the omission of the relevant variable μ . Recall that the μ can represent either measurement error in DAP or omitted relevant variables influencing DA. Estimating model (2) using (OLS) has two undesirable consequences: First, $\hat{\beta}$ is a biased estimator of β , with the direction of the bias being of the same sign as the correlation between PART and μ , and second, the standard error of ($\hat{\beta}$) is a biased estimator of the standard error of (β). In particular; if PART and μ are uncorrelated, the standard error of ($\hat{\beta}$) will provide an upwardly biased estimate of the standard error of ($\hat{\beta}$).

These consequences lead to the following three problems for statistical inference in tests for earnings management: The first problem concerns incorrectly attributing earnings management to PART. If the earnings management that is hypothesized to be caused by PART does not take place (i.e., the true coefficient on PART is zero) and μ is correlated with PART, then the estimated coefficient on PART, will be biased away from zero, increasing the probability of a type I error.⁴⁴ This problem will arise when the proxy for discretionary accruals contains

⁴⁴ A Type I error occurs when you reject a true null hypothesis. In this case you reject the null hypothesis of no earnings management and conclude that earnings are managed, when there in fact is no earnings

measurement error that is correlated with PART and/or other variables that cause earnings management are correlated with PART and are omitted from the analysis. In this latter case, earnings management is correctly detected by the model, but causality is incorrectly attributed to PART.

A second issue may be that earnings management is unintentionally extracted, caused by PART. If the earnings management that is hypothesized to be caused by PART does take place and the correlation between μ and PART is opposite in sign to the true coefficient on PART, then the estimated coefficient on PART will be biased toward zero. This will increase the probability of a type II error. This problem will arise when the model used to generate the discretionary accrual proxy unintentionally removes some or all of the discretionary accruals. Under such conditions, the measurement error in the proxy for discretionary accruals (i.e. μ) will be negatively correlated with the discretionary accrual proxy, causing the coefficient on PART to be biased toward zero.

Finally, a third problem may be the low power of the tests. If μ is not correlated with PART, then the estimated coefficient on PART will not be biased. However, the exclusion of relevant (uncorrelated) variables leads to an inflated standard error for the estimated coefficient on PART. This will increase the probability of a type II error.

As discussed in McNichols (2000), there are many reasons to suspect that the estimated discretionary accruals from the Jones model reflect nondiscretionary forces rather than pure discretion. In particular, the Jones model assumes accruals react to the current change in sales, but that lagged and future changes are not relevant. Counter to this assumption are the assumptions in Bernard and Stober (1989) and Dechow et al. (1998) that accruals do not fully adjust to a contemporaneous sales shock; rather, adjustment occurs over succeeding periods. Furthermore, anticipation of future sales growth is likely to influence management's estimates, as reflected in accruals. Consistent with this, McNichols (2000) documents that analysts' long-term earnings growth forecasts have significant explanatory power for residuals estimated using the Jones model, suggesting that growth is a significant correlated omitted variable in this model.

The model of accruals in chapter 2 suggests that as long as the assumptions about the parameters and about the random walk property for sales, and therefore earnings, are descriptive, expected accruals are zero. However, if forecasted sales changes are not zero (i.e., sales depart from a random walk) or when profit margins or other parameters affecting accruals change, then forecasted earnings changes as well as accruals are non-zero. Forecasted sales and earnings

management or at least not caused by PART. A Type II error occurs when you do not reject a false null hypothesis.

changes can be positive or negative depending on whether performance is expected to mean revert or to exhibit momentum. Extreme one-time increases or decreases in performance are likely to produce mean reversion, whereas growth stocks might exhibit momentum for a period of time. Mean reversion or momentum in sales and earnings performance is quite likely for firms exhibiting unusual past performance. This predictability in future performance generates predictable future accruals. Unless the discretionary accrual models adequately filter out this performance-related predictable component of accruals, there is a danger of spurious indication of discretionary accruals. Previous research (e.g., Dechow et al., 1995; Guay et al., 1996) suggests the likelihood of a spurious indication of discretionary accruals is extremely high in samples experiencing unusual past performance (i.e., non-random samples). Empirical evidence also documents that discretionary accrual estimates are correlated with earnings performance. Dechow et al. (1995) and Kasznik (1999) find that firms with higher (lower) earnings exhibit significantly positive (negative) discretionary accruals, suggesting earnings management varies with earnings or that the Jones (1991) model used to estimate nondiscretionary accruals is mis-specified.

Another issue in aggregate accrual models is the implicit assumptions in these models that accruals are a linear function of future performance. The regression approach of Jones (1991) imposes stationarity of the relation through time or in the cross-section, and perhaps more importantly, imposes linearity on the relation between the magnitude of performance and accruals. However, for statistical as well as economic reasons, the mapping of current performance into future performance, or the mapping of performance into returns, can be expected to be non-linear (e.g. Freeman and Tse, 1992; Basu, 1997; Watts, 2003). Previous research shows that extreme performance is mean reverting, whereas average performance is quite persistent, which implies a non-linear relation between current and future performance across the entire cross-section.

Economic reasons for the non-linearity are rooted in accounting conservatism and incentives for earnings management (see Watts and Zimmerman, 1986; Basu, 1997; Watts, 2003). Accounting conservatism dictates that losses, but not gains, be anticipated. For example, asset write-offs, goodwill impairment, and restructuring charges all entail reporting the capitalized amounts of losses. In contrast, gains from asset revaluations and capitalized amounts of expected benefits from research and development and/or patents are not included in earnings until realized in future periods. Therefore, reported earnings include capitalized amounts of losses, whereas predominantly the gains included in earnings are flow amounts. Capitalized amounts of losses are far less persistent compared to gains, which imparts a non-linearity in the relation between current and future earnings. A similar non-linearity is predicted as a

result of management's tendency to take a "big bath" in bad economic times (Kothari et al., 2005).⁴⁵

There is some evidence of non-linearity in the literature. In Basu (1997), cash flow and earnings variables exhibit different incremental slopes when regressed on negative stock returns. A similar result is in Ball, Kothari and Robin (2000) for an international sample. The implication is that accruals are a piecewise linear function of economic gains and losses. DeAngelo et al. (1994) and Butler et al. (2004) show that financially distressed firms have extremely negative abnormal accruals. Butler et al. (2004) attribute this to liquidity enhancing transactions (such as factoring receivables) and DeAngelo et al. (1994) attribute it to earnings management. However, it is also consistent with timely loss recognition, which is more likely to occur in distressed firms. Dechow et al. (1995) and Kothari et al. (2005) find that accrual models are mis-specified for firms with extreme performance, which in part could be due to timely loss recognition in the extremely poor-performing firms. Kothari et al. (2005) discuss the role of timely loss recognition in accruals, but do not estimate non-linear accruals models.

These results do not in itself indicate the extent to which linear accruals models such as the Jones and Dechow-Dichev models are mis-specified. Ball and Shivakumar (2005, 2006) introduce a model that allow for a piecewise linear specification of the accrual process. They show that non-linear accruals models are a substantial specification improvement, explaining up to three times the amount of variation in accruals as conventional linear specifications such as Jones (1991). This leads to the conclusion that conventional linear accruals models, by omitting the role of accruals in asymmetrically timely loss recognition, offer a comparatively poor specification of the accounting accrual process.

Recent research has come up with improved methods to mitigate problems associated with aggregate accrual models. Either the inclusion of firm performance as an explanatory variable in the discretionary accrual model or adjustment of a firm's estimated discretionary accrual by that of a performance-matched firm would serve to mitigate the likelihood that the resulting estimated discretionary accruals would systematically be non-zero (i.e., lead to invalid inferences about accrual behavior). Dechow et al. (2003) for instance extend the Jones model with the objective of producing an accrual model with higher explanatory power. As mentioned, all models of discretionary accruals can be criticized for misclassifying nondiscretionary accruals as discretionary. Dechow et al. (2003) tried to correct for this problem by adding additional

⁴⁵ Kothari et al. (2005) argue that unless a discretionary accrual model, like the Jones or modified-Jones model, is improved to address non-linearities, they do not expect the regression approach to be effective at controlling for non-zero estimated discretionary accruals in stratified random samples.

variables that at an intuitive level are expected to vary with nondiscretionary accruals, and by including them in the model reduce the extent of misspecification of the Jones model. These adjustments result in a revised model of discretionary accruals that has twice the explanatory power of the cross-sectional modified Jones model that is commonly used in empirical research. Kothari et al. (2005) suggest adjusting the accruals used in the model by that of a performance-matched firm to get performance matched discretionary accrual measures.⁴⁶ In contrast to the regression approach, the matched-firm approach does not impose any particular functional form on the relation between performance and accruals. It simply assumes that, on average, the treatment and control firms have the same estimated non-event discretionary accruals. This is an alternative approach to the method used by Dechow et al. (2003), who would have controlled for the influence of prior firm performance on estimated discretionary accruals by expanding the set of explanatory variables in the model.

5.3.2 Specific accruals

Instead of examining an aggregate of all accruals to detect earnings management, researchers can also examine at the effect of managerial discretion on specific accruals or a set of specific accruals (e.g. Marguardt and Wiedman, 2004). McNichols (2000) presents advantages and disadvantages to this approach relative to the aggregate accruals approach. With the specific accrual approach, it is possible to estimate the relation between the single accrual and explanatory factors directly. With the aggregate accrual models, it was possible that different components related differently to the explanatory variables, so that aggregating could result in estimation errors for parameter estimates. Using a single accrual overcomes this problem. Also, a specific

⁴⁶ Kothari (2005) controls for performance using a performance-matched firm's discretionary accrual matched on return on assets as a performance measure. Their motivation for controlling for performance stems from the simple model of earnings, cash flows, and accruals discussed in chapter 2. This model shows that working capital accruals increase in forecasted sales growth and earnings because of a firm's investment in working capital to support growth. Therefore, if a firm's performance exhibits momentum or mean reversion (i.e., performance deviates from a random walk), then expected accruals would be non-zero. Earnings momentum might be observed because firms with high growth opportunities often exhibit persistent growth patterns. Similarly, accounting conservatism can produce earnings persistence (i.e., momentum) in the presence of good news and mean reversion in the presence of bad news (Basu, 1997). In addition, there is evidence of mean reversion conditional on extreme earnings performance (e.g. Brooks and Buckmaster, 1976). As a result, accruals of firms that have experienced unusual performance are expected to be systematically non-zero. Their choice of return on assets as a performance measure is motivated by intuition (by definition, earnings deflated by assets is return on assets which measures performance) and prior research (studies analyzing long-run abnormal stock return performance and abnormal operating performance find that matching on ROA results in better specified and more powerful tests when compared to other matching variables).

accrual approach can be applied in contexts which cause the accruals in question to be a material and a likely object of judgment and discretion. A specific setting can also provide insight on variables to control to better identify the discretionary component of a given accrual. However, it is crucial that the specific accrual reliably reflect the exercise of discretion. If it is not clear which accrual management might use to manipulate earnings, then the power of a specific accrual test for earnings management is reduced. Furthermore, if the aim of the research is to identify the magnitude of manipulation on earnings, rather than to test whether it is associated with hypothesized factors, then one would require a model for each specific accrual likely to be manipulated by management.⁴⁷

In trying to identify contexts where the incentives to manage earnings are of interest and reliable, several studies using specific accruals have focused on a specific industry or set of industries. A distinctive feature of these studies is the use of generally accepted accounting principles to specify what the nondiscretionary component of an accrual should be.

A lot of recent research using the specific accrual approach has focused on the banking and insurance industry. Petroni (1992) identified the loss reserves of property and casualty (P&C) insurers as an ideal context for application of a specific accruals approach. Claim loss reserves are generally the largest liability on a P&C insurer's balance sheet, and the income effect of the related provision is substantial.⁴⁸ The matching principle requires insurers to charge claim losses to operations in the period they are incurred and the related premium revenue is recognized. As information becomes available regarding prior period claims, insurers revise their original estimate of loss reserves with a charge to current period operations. After all claims for a period have been settled, policy losses for that period are known with certainty. Property-casualty firms are required to provide disclosure on the ex post estimation error for reserves reported in earlier years, where the amount of this error is called development.⁴⁹ Researchers can estimate the discretionary component without a specification of either discretionary or nondiscretionary variables (i.e. the revised estimate can then be used as a proxy for the unbiased expectation of policy losses). Development includes ex post surprises of a nondiscretionary nature, for instance

⁴⁷ McNichols (2002) also mentions two other possible disadvantages of the specific accrual approach. First, specific accruals approaches generally require more institutional knowledge and data than aggregate accruals approaches. This raises the cost of applying such approaches. Second, the number of firms for which a specific accrual is managed may be small relative to the number of firms with aggregate accruals. This may limit the generalizability of the findings of specific accruals studies, and may preclude identification of earnings management behavior if specific accruals are not sufficiently sensitive.

⁴⁸ In for instance Beaver et al. (2003), the loss reserve liability is 56 percent of total liabilities, and the provision for losses is 71 percent of premium revenue.

⁴⁹ Although some claims are settled in the year incurred, the majority will remain outstanding for several years. Insurers are required to disclose the year-by-year revisions, called loss reserve development, for each of the past 10 years.

the estimation errors caused by lack of expertise. However, if the development is not subject to discretion, then it has an expected value of zero, and, by implication zero serial correlation.

The uncertainty surrounding the estimation of the costs to settle incurred but unpaid claims provides an opportunity for substantial earnings management because understating (overstating) the reserve accrual increases (decreases) reported earnings. These circumstances provide a unique situation, where a specific accrual is very material, and where regulation allows the researcher to identify how estimates for this accrual initially reported correspond to ex-post outcomes. Petroni's (1992) study, and subsequent studies by for instance Beaver and McNichols (1998), Nelson (2000) and Beaver et al. (2003), exploit these unique disclosures to test hypotheses about earnings management. Specifically, the disclosures allow the researcher to identify firms that ex post under- or over-reserved, and to test hypotheses about the factors motivating this behavior. Access to this measure greatly mitigates concern about measurement error in the discretionary accrual proxy being correlated with the partitioning variable because of the transparency of the measure.

For example, Petroni (1992) documents that financially weak insurers tend to underestimate loss reserves relative to companies exhibiting greater financial strength. Gaver and Paterson (2001) build on these findings to examine the influence of regulation of insurance company financial reporting on financial statement manipulation. Specifically, Gaver and Paterson hypothesize and find that accreditation of states' financial reporting requirements, which requires an annual audit and establishes minimum standards for loss reserves, is associated with significantly less under-reserving by financially weak insurers. Beaver and McNichols (1998) propose serial correlation in year-by-year loss reserve errors as an indication of loss reserve manipulation, because unbiased reserve estimates by management should result in serially uncorrelated reserve errors. They find strong evidence of manipulation in loss reserves, with the median firm exhibiting serial correlation in reserve errors of 0.59.

Beaver et al. (2003) examine the relation between management of the loss reserve accrual and the distribution of reported earnings, and document that P&C insurers report small positive earnings with greater frequency than expected given the relative smoothness of the remainder of the earnings distribution, and that these firms significantly understate the loss reserve accrual relative to firms with small negative earnings. Their analysis indicates that earnings management occurs across the entire distribution of reported earnings, with earnings management by small profit firms accounting for only a fraction of total earnings management activity. Specifically, they find that the least profitable firms understate reserves relative to the most profitable firms. This evidence is consistent with P&C firms managing loss reserves to smooth earnings rather

than to take an earnings “bath.” The study by Beaver et al (2003) is not only significant because it provides decisive evidence that firm manage earnings across the entire distribution of earnings, but also because it uses another research approach, i.e. it look at the distribution of earnings after management.

The studies in the property and casualty insurance industries provide strong evidence of earnings management. While the institutional contexts may limit generalizability to other industries, and the issue of classifying discretionary and nondiscretionary behavior remains, grounding the research in a more focused institutional setting can provide greater insight and structure regarding the nature of likely correlated omitted variables. However, not only the insurance industry provides evidence on specific accruals. Moehrle (2002), for instance, investigates whether firms use restructuring charge reversals to manage earnings to meet benchmarks, and shows that some firms record reversals to meet or beat these targets. Philips et al. (2003) attempt to reduce the measurement error in accrual metrics by focusing on the deferred tax expense. Philips et al. (2003) claim that deferred tax expense can be used to better measure managers’ discretionary choices under generally accepted accounting principles (GAAP) because the tax law, in general, allows less discretion in accounting choices relative to the discretion that exist under GAAP. Therefore, they expect that managers seeking to manage earnings to achieve some threshold do so by exploiting the greater discretion they have for financial reporting purposes. They assume that managers prefer to manage income upwards without also increasing taxable income. Thus, the exercise of managerial discretion to manage income upwards should generate temporary book-tax differences and, hence, deferred tax expense should be useful in detecting earnings management. They examine three settings in which they expect earnings management, i.e. to avoid earnings declines, losses and failing to meet or beat analysts’ forecast. The method they use is a combination of different earnings management research designs. They look at the distribution of the item around the threshold, which indicate that deferred tax expense is used to manage earnings. Then they compared the results with the cross-sectional Jones model and the forward looking model from Dechow et al (2003). Both models provide good results. However, they then use the performance matched accrual approach of Kothari et al (2005), which result in the accrual models not being significant anymore, while deferred tax expense still holds. Thus, they use a specific accrual approach with an aggregate accrual approach and a distribution approach to provide evidence of earnings management.

5.3.3 Distribution of earnings approach

The studies by Burgstahler and Dichev (1997) and DeGeorge et al. (1999) use a different approach to detect earnings management. These studies focus on the density of the distribution of earnings after management, i.e. they look at the shape of the distribution of earnings. They suggest that if firms have greater incentives to achieve earnings above a benchmark, then the distribution of earnings after management will have fewer observations than expected for earnings amounts just below the threshold, and more observations than expected for earnings just above the threshold. Specifically, they hypothesize that corporate managers have incentives to avoid reporting losses, reporting declines in earnings, or avoid not meeting analysts' forecast. and examine the distribution of reported earnings around these points. Figure 5.2, taken from Burgstahler and Dichev (1997), shows how this can be presented graphically. The findings indicate that there is a higher-than-expected frequency of firms with slightly positive earnings (or earnings changes) and a lower-than-expected frequency of firms with slightly negative earnings (or earnings changes). This visual representation of the earnings distribution suggests that earnings are managed to meet earnings targets.

This approach has several advantages (Healy and Wahlen, 1999). First, the authors do not have to estimate (potentially noisy) abnormal accruals. Instead, they inspect the distribution of reported earnings for abnormal discontinuities at certain thresholds. More specifically, they do not attempt to measure earnings management for individual companies (using, say, discretionary accruals models) and then aggregate results across firms in similar economic circumstances to reach overall conclusions. Rather, they point to attributes of the distribution of earnings for large samples (or even populations) of companies and then assert that these properties are consistent with earnings management. The power of their approach comes from the specificity of their predictions regarding which group of firms will manage earnings, rather than from a better measure of discretion over earnings. Second, the authors are able to estimate the pervasiveness of earnings management at these thresholds.

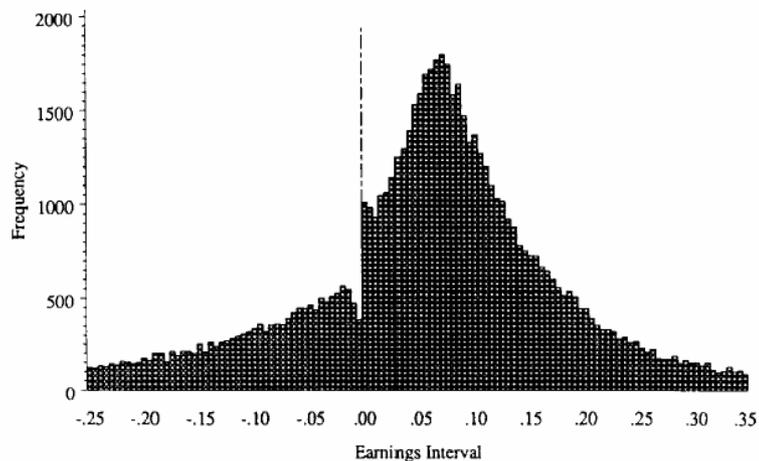


Figure 5.2 Distribution of annual net income, taken from Burgstahler and Dichev (1997).

The papers by Burgstahler and Dichev (1997) and DeGeorge et al. (1999) suggest that earnings are managed. However, they lack evidence of the specific methods by which earnings are managed. Consequent research on the distribution of earnings solves this caveat by combining this approach with the specific accruals approach. For instance, Beaver et al. (2003) provide direct evidence that P&C insurance firms who avoid reporting small losses do so by managing loss reserves. They document that property-casualty insurers with small positive earnings understate loss reserves relative to insurers with small negative earnings. Furthermore, loss reserves are managed across the entire distribution of earnings, with the most income-increasing reserve accruals reported by small profit firms, and the most income-decreasing reserve accruals reported by firms with the highest earnings.

These studies measure discretion over earnings as the behavior of earnings after management, which is likely to include discretionary and nondiscretionary components. McNichols (2000) argues that it seems implausible that the behavior of the nondiscretionary component of earnings could explain such large differences in the narrow intervals around their hypothesized earnings targets. Stated differently, measurement error in their proxy for discretionary behavior seems unlikely to be correlated with their partitioning variable. However, these papers have to rely on the notion that the empirical regularities can only be explained as earnings management. Several papers question this notion.

Beaver et al. (2005) argue that the discontinuity in the distribution of earnings is largely due to the asymmetric effects of income taxes and special items. They find that effective tax rates are asymmetrically higher for profit firms, causing a disproportionate shift of profit observations

to the region just above zero. Similarly, conservatism causes the magnitude and frequency of negative special items to be asymmetrically higher for loss firms, causing a disproportionate shift of observations from the region just below zero to larger losses. Thus, they argue that measurement error in the proxy for discretionary behavior, the increased frequency of small profits, is correlated with the partition on profits and losses. However, they note that this does not imply that the discretionary component of either item is zero, only that the clustering of observations just above zero is not primarily induced by loss avoidance behavior.

Dechow et al. (2003) examine the discretionary operating accruals of firm-years with earnings just above and just below zero to test whether firms manage earnings to avoid losses. They find that firms with small positive earnings have positive discretionary operating accruals, but that these accruals are not significantly greater than the discretionary operating accruals of firms with small negative earnings. As a result, they conclude that their results show that the kink in the earnings distribution is not caused by earnings management, provided that their discretionary accrual models detect earnings management. Dechow et al. (2003) suggest that exchange listing selection bias and scaling by market value of equity may explain the discontinuity in the distribution of net income. They find that the kink is more extreme for newly listed firms than for firms that are over twenty years of age. However, the kink still remains. Then, they suggest that investors could use different valuation approaches for loss versus profit firms. They find that scaling by number of shares outstanding considerably mitigates the kink. They conclude that scaling by market value alters the shape of the earnings distribution. However, they find it difficult to evaluate the kink at the zero mode (Dechow et al. 2003, p. 377).

Durtschi and Easton (2005) provide a more detailed analysis of the scaling explanation. Their paper is motivated by the observation that, in contrast to the frequency distribution of deflated earnings, the frequency distributions of net income, basic earnings per share, and diluted earnings per share do not show a discontinuity at zero. In fact, inconsistent with the presumption of earnings management to exceed a zero earnings threshold, they demonstrate that there are more observations with a one-cent per share loss than a one-cent per share profit with a peak in the frequency distribution at zero cents per share. They also find that for the deflator of net income (i.e. market value of equity), price per share for losses is lower than price per share for the equivalent profit. Additionally, they show that the sample selection criterion requiring beginning-of-year prices exacerbates the discontinuity, suggesting that pricing differences and sample selection bias as alternative explanations for the discontinuity in the frequency distribution of deflated change in earnings. Finally, regarding the interpretation in the literature that the predominance of zero forecast errors and small positive forecast errors (as opposed to the lesser

number of small negative forecast errors) should be regarded as evidence of earnings management to meet or beat analysts' forecasts, Durtschi and Easton (2005) argue that the discontinuity may reflect a tendency for analysts to avoid coverage of firms with small losses (rather than being an indication of management of earnings) and/or should be seen in the context of analysts' optimism, where the analysts' forecast errors tend to be much greater when analysts are optimistic than when analysts are pessimistic.

Ball and Shivakumar (2005) argue that an asymmetric relation between accruals and cash flows for timely loss recognition helps explain the asymmetric shape of the earnings and earnings changes distributions reported in Burgstahler and Dichev (1977). As cash flow falls, the frequency of accrued losses (e.g., provisions, inventory write-downs, asset impairments) rises, thereby moving mass to the left tail of the earnings distribution. The earnings distribution then is missing mass above and immediately below the mean, and has additional mass in the left tail. They conjecture that much of the shape of the earnings distribution is due to the asymmetric loss recognition role of accruals, combined with the positive correlation between current period cash flows and accrued losses.

5.3.4 Other approaches to detecting earnings management.

One alternative approach in earnings management research focuses on earnings management measures that examine the relation between cash flow and aggregate accruals (e.g. Leuz et al, 2003; Lang et al. 2006). Leuz et al. (2003) consider the ratio of the firm-level standard deviation of earnings to the firm-level standard deviation of cash flow from operations. According to Leuz et al. (2003), a low value of this measure indicates that insiders exercise accounting discretion to smooth reported earnings, since a low ratio indicates that earnings are less volatile than underlying cash flows. This suggests that accruals are used to produce earnings that reflect the volatility of the underlying economics to a lesser extent than cash flows. Another measure used is the contemporaneous correlation between changes in accounting accruals and changes in operating cash flows to examine earnings smoothing. A negative correlation is expected, as accruals buffer cash flow shocks in reported earnings (Dechow, 1994). A larger magnitude of this correlation would indicate smoothed earnings that does not reflect a firm's underlying economic performance, and is therefore considered an indicator of earnings management. Finally, the third earnings management measure uses the magnitude of accruals as a proxy for the extent to which insiders exercise discretion in reporting earnings. It is computed as the absolute value of firms' accruals scaled by the absolute value of firms' cash flow from operations. The scaling controls for

differences in firm size and performance (Leuz et al., 2003). Leuz et al. (2003) argue that apart from dampening fluctuations in firm performance, insiders can use their reporting discretion to misstate their firm's economic performance. For instance, insiders can overstate reported earnings to achieve certain earnings targets or report extraordinary performance in specific instances, such as an equity issuance. Therefore, this measure uses the magnitude of accruals as a proxy for the extent to which insiders exercise discretion in reporting earnings.

Aside from the research designs that are commonly used in earnings management that have been discussed, other research designs for examining earnings management behavior have delivered great new insight in the methods and incentives for earnings management. These studies typically do not rely on the analysis of large data sets. Rather, they consist of research designs like surveys and experiments. Nelson et al. (2002) for instance use a field-based questionnaire to elicit auditors' recollections of specific incidents where managers attempted to manage earnings.⁵⁰ This approach provides transaction-level data about earnings management attempts and auditors' adjustment decisions. Therefore, it allows for disentangling managers' and auditors' decisions by examining hypothesized relations involving managers' decisions about how to attempt earnings management (conditional on the decision to make an attempt that the auditor detected) and auditors' decisions about whether to adjust an attempt (conditional on identification of the attempt).

Nelson et al. (2002) report analyses of data obtained from a questionnaire in which 253 audit partners and managers from one Big 5 firm recalled and described 515 specific experiences they had with clients who they believed were attempting to manage earnings. This transaction-level data about attempts covers a range of financial accounting transactions, including attempts that are purely judgmental as well as attempts that involve transaction structuring. This data allow the researcher to examine how attempts are affected by the precision of financial accounting standards and by other characteristics of attempts.

One of the key points of this study is that it separately determines managers' decisions about how to attempt earnings management and auditors' decisions about whether to require adjustments. Thus, it provides evidence about how a key feature of accounting standards (precision of rules) and a key feature of the financial reporting process (activity of external auditors) influence earnings management.

Results indicate that the earnings management attempts occurred in numerous accounting areas, including revenue recognition, business combinations, intangibles, fixed assets, investments and

⁵⁰ For their article "Evidence from Auditors about Managers' and Auditors' Earnings Management Decisions" in 2002, Mark Nelson, John Elliott and Robin Tarpley won the Notable Contribution to Accounting Literature Award in 2004. This award is handed out to recognize research of exceptional merit.

leases, but by far the most frequently identified attempts involve reserves. Respondents believe that managers' attempts were motivated by a variety of incentives, including the need to meet analysts' estimates and influence the stock market, to reach targets set by compensation contracts or debt covenants, to communicate economic information to stakeholders, and to smooth income or improve future income, as well as by combinations of these incentives.

This type of research is not based on statistical definitions of earnings management. Rather, it focuses on practical evidence. However, one must still exert caution when reaching strong conclusions from this type of work. For instance, auditors' self-reporting may be subject to error and bias and may require significant interpretation. Therefore, future research on earnings management remains challenging, and should build on the results discussed in this chapter.

5.4 Summary and implications for this study

In this chapter, research on earnings management is reviewed. Results of academic research on earnings management face a lot of scrutiny. The research design used for earnings management research is possibly not equipped to make strong conclusions on earnings management.

Three dominant research designs are used to test for earnings management: aggregate accruals tests, specific accruals tests and distribution of earnings tests. While aggregate accruals tests receive the most criticism, they remain the most used test for earnings management. Specific accrual tests and distribution of earnings tests mitigate some of the problems associated with aggregate accrual test. Most recent research use a combination of either three approaches to come up with more conclusive evidence on earnings management. The most important conclusion from this search of earnings management research is that future research will have to either improve existing methods or use new research methods to examine earnings management.

Measures or incentives for earnings management are examined in chapters 6, 7 and 8. In chapter 6, I examine the most dominant test method in earnings management literature, the aggregate Jones-accrual model. I examine if Jones-abnormal accruals are a factor in the prediction of future cash flow. In chapter 7, I examine the effect of growth on accrual measures based on the relation between cash flows and accruals, and on specific accruals. More specifically, I examine if growth causes a bias in these measures of earnings management. In chapter 8, I examine if the difference in conditional conservatism between profit firms and loss firms can expand on the distribution of earnings approach of earnings management.